#### SCS ENGINEERS

# Results of Subsurface Investigation with 1<sup>st</sup> Quarter and 2<sup>nd</sup> Quarter 2005 Groundwater Monitoring and Sampling Events and Work Plan for Additional Subsurface Investigation

Weeks Drilling & Pump Company, Inc. 6100 Sebastopol Road (Highway 12) Sebastopol, California (SCDHS ID #00001493; NCRWQCB Site #1TSO680) (Assessor's Parcel No. 060-020-019)

File Number 01203340.00

Prepared by:

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To:

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9 June 2005

#### LIMITATIONS/DISCLAIMER

This report has been prepared for Weeks Drilling & Pump Company, Inc. with specific application to subsurface exploration, quarterly monitoring events, and proposed subsurface investigation for the property located at 6100 Sebastopol Road, Sebastopol, California. This report has been prepared in accordance with the care and skill generally exercised by reputable professionals, under similar circumstances, in this or similar localities. The conclusions contained herein are based on analytical data, and points of exploration. The nature and extent of subsurface conditions may and likely do vary between borings and/or points of exploration. No other warranty, either expressed or implied, is made as to the professional conclusions and proposal presented herein.

Access to the property and the surrounding area was and is limited by buildings, roadways, underground and above-ground utilities and other miscellaneous site and site vicinity features. Therefore, the field exploration and points of subsurface observation were and are somewhat restricted.

Changes in site use and conditions may occur due to man-made changes or variations in rainfall, temperature, water usage, or other factors. Additional information which was not available to the consultant at the time of this assessment and proposal or changes which may occur on the site or in the surrounding area may result in modification to the site and the vicinity that would impact the summary and proposal presented herein. This report is not a legal opinion.

We trust this report provides the information you require at this time and we appreciate the opportunity to work with you on this project. If you require any additional information, or have any questions, please do not hesitate to contact SCS at (707) 546-9461.

Kevin L. Coker REA 7887

CA registration fees paid through 06/30/05

HI X

Stephen Knuttel PG 7674 CA registration fees paid through 07/31/05 Date

Date

#### Introduction

SCS Engineers (SCS) is pleased to present the results of subsurface investigation, the 1<sup>st</sup> and 2<sup>nd</sup> Quarter 2005 groundwater monitoring and sampling events and a work plan for additional subsurface investigation for Weeks Drilling and Pump Company, Inc. (Weeks), 6100 Sebastopol Road, Sebastopol, California. The subsurface investigation described herein was performed in accordance with SCS' Work Plan (SCS, 2004d) which was subsequently approved by the Sonoma County Department of Health Services (SCDHS, 2004b). A proposal for additional investigation has been included in this report with regulatory concurrence from the SCDHS (SCDHS, 2005). The site is located as shown on the Site Location Map, Figure 1 (Assessor's Parcel No. 060-020-019). General site features are shown on the Site Plan, Figure 2.

#### **Background**

One 10,000 gallon unleaded gasoline underground storage tank (UST) was removed from the site in December 1997 by MRL Underground Tank Testing. One 1,000-gallon UST which previously held gasoline was abandoned in-place under the direction of the Sonoma County Department of Emergency Services (SCDES) on September 17, 2003. The approximate former location of the 10,000 gallon UST is now occupied by an above ground storage tank which is shown on Figure 2; the approximate location of the 1,000-gallon UST is as shown on Figure 2. The results from two soil samples collected from the 10,000-gallon UST excavation and one soil sample collected from the stockpiled soil indicated that concentrations were below the laboratory method detection limit (MDL) for total petroleum hydrocarbons (TPH) as gasoline (g), benzene, toluene, ethylbenzene, and xylenes (BTEX), and methyl tertiary butyl ether (MTBE). Groundwater was present in the UST excavation and a sample of the groundwater was collected and analyzed. The sample contained 2,500 micrograms per liter (ug/L) TPH-g, 2,100 ug/L MTBE, 29 ug/L benzene, 130 ug/L toluene, 25 ug/L ethylbenzene, and 150 ug/L xylenes. It is SCS' understanding that the soil was disposed as an inert material based on the analytical results. The excavation was subsequently backfilled. The SCDHS subsequently issued an Underground Storage Tank Unauthorized Release/Contamination Report (SCDHS, 1998).

#### **UST Abandonment In-Place**

The 1,000-gallon gasoline UST was abandoned in-place due to its location beneath the building. Weeks abandoned the UST by pumping cement/sand slurry from the bottom of the UST to the top. All residual fluids contained within the UST were captured through the vent tube and subsequently pumped into 55-gallon UN/DOT-approved drums (approximately 120 gallons). UST abandonment in-place was overseen by a representative from the SCDES. A report summarizing the abandonment in-place activities (which includes an Underground Storage Tank Unauthorized Release/Contamination Site Report) was prepared and submitted (SCS, 2003c).

Two slant borings (B-6 and B-7) were drilled at the approximate locations shown on Figure 2 on September 4, 2003 in order to evaluate the soil and groundwater to the extent feasible beneath the UST which was abandoned in-place (SCS, 2003c). This strategy was agreed upon in the field with the concurrence of the SCDHS inspector. One additional monitoring well (MW-9) was drilled and installed at the approximate location shown on Figure 2 on September 6, 2003. TPH-g was detected in each of the soil samples collected from B-6, B-7 (slant borings), and MW-9, with the exception of the MW-9-10' sample, at concentrations ranging from 8.7 mg/kg in B-7-10' to 3,200 mg/kg in B-7-5'. BTEX constituents were detected in each of the soil samples, with the exception of the B-6-15' and MW-9-10' samples, at concentrations ranging from 0.08 mg/kg benzene in B-7-10' to 190 mg/kg xylenes in B-7-5'. MTBE was not detected above the MDL in any of the samples analyzed. Lead was detected in each of the samples analyzed, with the exception of B-6-10', at concentrations ranging from 7.0 mg/kg in B-6-15' to 9.0 mg/kg in B-6-5'. Analytical results are summarized in Table 1.

#### **Previous Environmental Investigations**

Pacific Northwest Environet Group (PNEG)<sup>1</sup> oversaw the drilling and sampling of five borings (B-1 through B-5) at the approximate locations shown on Figure 2 on July 7, 1999 (PNEG, 1999). The soil samples were analyzed for TPH-g, BTEX, and MTBE. The soil samples were below the MDL for all analytes (Table 1).

Groundwater samples from borings B-1 through B-5 were analyzed for TPH-g, BTEX, the five ether-based oxygenates (MTBE, diisopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), tertamyl methyl ether (TAME), and tert-butyl alcohol (TBA)), and lead scavengers (Pb Scavs). The groundwater results from this investigation are summarized in Table 2. Samples B-2 through B-5 contained TPH-g and/or MTBE.

Three soil borings, which were converted into monitoring wells MW-1 through MW-3, were drilled and installed at the approximate locations shown on Figure 2 on June 1, 2001 (PNEG, 2001b). Soil samples from the monitoring well borings were below the MDL for all analytes, with the exception of trace detections of BTEX constituents (Table 1). Groundwater samples were below the MDL except for the detection of MTBE in MW-2 at 120 ug/L and in MW-3 at 41 ug/L (Table 4).

#### **Cone Penetrometer Test - 2002**

A cone penetrometer test (CPT) investigation was performed at the site on June 25, 2002 to determine the depth of the next water bearing zone at the site (PNEG, 2002e). The CPT rig was able to push to a depth of 50 feet before refusal occurred. The CPT rig identified a very thin sand layer from 27.5 to 28.5 feet and then encountered a significant sand and gravel zone beginning at a depth

<sup>&</sup>lt;sup>1</sup> PNEG merged with SCS Engineers in July 2003.

of 41.5 feet and continuing to the bottom of the hole. The CPT results were discussed with Dale Radford of the SCDHS, and a decision was made to install conductor casing in the deep well to 40 feet bgs and to screen the deep well in the major water bearing zone encountered from approximately 40 to 50 feet bgs.

Five additional monitoring wells, four shallow (MW-5 through MW-8), and one deep (MW-4D), were drilled and installed at the approximate locations shown on Figure 2 on July 1 and 2, 2002 (PNEG, 2002e). Soil samples were generally free of petroleum hydrocarbons except for trace concentrations of benzene, ethylbenzene, xylenes, and MTBE detected at a maximum concentration of 0.029 mg/kg. The results are summarized in Table 1.

#### **Sensitive Receptor Survey**

A Sensitive Receptor Survey (SRS) was conducted for the site in September 2000 in order to locate any petroleum vapor receptors, groundwater plume receptors, domestic wells, surface water features, and municipal wells within a one-half mile radius of the site located at 6100 Sebastopol Road (PNEG, 2000). A Department of Water Resources records search for all domestic, monitoring, and cathodic protection wells, within a one half mile radius of the site was also conducted.

Based on the results of the on-site and vicinity survey, no petroleum vapor receptors within 250 feet of the site were identified. In addition, based on the results of the records search and the on-site and vicinity survey no surface waters within 1,000 feet of the site were identified. Domestic wells within a one-half mile radius of the site are located as shown on Figure SRS.

## **Monitoring Well Installation - 2005**

Four additional monitoring wells, three shallow (MW-11, MW-12, and MW-13), and one deep (MW-10D), were drilled, sampled and installed at the approximate locations shown on Figure 2 between January 19 and 31, 2005. The borings for the shallow monitoring wells were drilled using 8-inch diameter hollow stem augers and were converted into monitoring wells using 2-inch diameter Schedule 40 flush threaded PVC material. The screened interval in the monitoring wells consists of 0.010-inch, machine-slotted screen which extends from approximately 4.5-6 to 15-17 feet bgs. A #2/12 sand was used to create a filter pack around the screen and an approximate 1.5 to 2 foot bentonite seal was placed on top of the sand filter pack. The wells were completed to the surface with a cement seal. The PVC well casing in each monitoring well extends to within 6 inches bgs and is fitted with a waterproof locking cap. The wells are protected by traffic-rated, water-tight circular vaults. Additional well completion details are presented on the attached Well Completion Diagrams, Appendix B.

Based on the results of the previous drilling programs, soil samples were collected and examined for lithology from each of the borings beginning at an approximate depth of 5 feet bgs, and every 5 feet thereafter to a maximum depth of approximately 17.0 feet bgs. Two soil samples from each of the borings were submitted for analysis. The ends of the sample tubes selected for analysis were covered with Teflon® Tape and sealed with plastic caps. Soil samples were labeled, stored under refrigerated conditions, and transported under Chain-of-Custody documentation to Analytical Sciences of Petaluma, California for analysis. AS is a California Department of Health Services certified laboratory for the analysis requested. Copies of AS' current certifications have been reviewed and are on file. The soil samples were collected following Standard Soil and Water Sampling Procedures and QA/QC Protocol.

The boring for the deep monitoring well was drilled using a combination of hollow stem augers and mud rotary to a maximum depth of 57 feet bgs. The hole was originally drilled to 40 feet using 14inch diameter hollow stem augers. When attempting to set the conductor casing, the hole collapsed. Several attempts were made to clean out the hole and set the casing; however, the casing could not be advanced beyond approximately 30 feet. The hole was therefore later re-drilled to 40 feet by mud rotary methods and the casing was set to 40 feet. The conductor casing was then set and cemented in place in order to isolate the shallow water-bearing zone. The cement was allowed to cure around the casings after which the well was extended to a maximum depth of 60 feet bgs using 8-inch diameter hollow stem augers. The deep boring was converted into a monitoring well using 2-inch diameter Schedule 40 PVC blank well casing. The screened interval in the well consists of 0.010inch machine-slotted screen, and extends from approximately 44.5 to 54.5 feet bgs (Appendix B). The well was installed with a #2/12 sand as a filter pack. The filter pack was brought to approximately 2 feet above the top of the screen, an approximate 12.5-foot bentonite seal was placed on top of the sand filter pack, and the well was completed to the surface with a cement seal. The PVC well casing extends to within 6 inches bgs and has been fitted with a waterproof locking cap. The well is protected by a traffic-rated, water-tight, circular vault. Additional well completion details are presented in Appendix B. In accordance with SCS' Work Plan (SCS, 2004d), no soil samples were collected for analysis from the deep boring.

The augers were pressure washed, and the small sampling equipment was washed in a detergent solution and rinsed. The drill cuttings were placed on and covered with plastic sheeting, pending disposal. The water generated by decontamination, well development, and sampling is stored at the site in steel 55-gallon UN/DOT-approved drums, pending disposal. Options for the disposal of the soil and groundwater are being evaluated.

#### **Laboratory Analysis - Soil**

Soil samples collected from the monitoring well borings were analyzed for TPH-g using EPA Method 8015M, and for BTEX, and the five ether-based oxygenates by EPA Method 8260B. Additionally, the sample collected from MW-12 at a depth of 7.0' was analyzed for lead for disposal purposes.

#### Well Development

Three of the four newly installed monitoring wells, MW-11 through MW-13, were developed on February 2, 2005 using a surge block and a submersible field portable groundwater purging pump. Due to a lack of water in the deep well, MW-10D, the field technician was unable to develop MW-10D sufficiently on February 2, 2005 and therefore returned to the site on March 21, 2005 at which time the field technician was able to sufficiently develop the well. Information obtained during well development was recorded on field sampling forms from which Well Development Records were generated, copies of which are presented in Appendix C.

# 1st Quarter 2005 Groundwater Monitoring and Sampling Event

#### **Groundwater Monitoring**

Depth to groundwater measurements were collected from each of the previously existing wells (MW-1 through MW-9) in addition to the newly installed wells (MW-10D through MW-13) on February 7, 2005. Depth to groundwater measurements in the shallow wells ranged from approximately 4 to 5.5 feet below existing ground surface (bgs). Depth to groundwater in MW-4D was 47.80 feet bgs. As discussed above, insufficient water was present in the well casing of MW-10D to obtain accurate water level conditions on February 2, 2005. The depth-to-groundwater measurements were combined with the well casing elevations to determine the groundwater flow direction and gradient. Casing and groundwater elevations are reported in feet relative to mean sea level. Depths to groundwater are expressed in feet. For the 1<sup>st</sup> quarter 2005 sampling event, the groundwater flow direction for the shallow wells was interpolated to be SSE at a calculated gradient of 0.006. A deep groundwater flow direction could not be calculated as only two deep wells are present, however, these tow wells indicate a southerly component to the flow direction.

#### **Groundwater Sampling**

After the newly installed monitoring wells were developed, they were allowed to set for approximately 5 days prior to collecting depth to groundwater measurements. After depth to groundwater measurements were collected, each well was checked for the presence of free product by subjective evidence and using an oil/water interface probe. No free product was reported during this monitoring event, although the field technician reported a strong hydrocarbon odor in MW-9 during purging. Subsequent review of the information collected from MW-9 has indicated that the sample collected from MW-9 on February 7, 2005 consisted of free product. The wells were then purged of approximately 3 wetted well casing volumes of groundwater, or at least 5 gallons,

whichever was greater, or until they went dry, using either a submersible pump or a clean disposable bailer. Temperature, pH, conductivity, turbidity, and dissolved solids were measured during purging to help demonstrate that fresh groundwater was entering the well casing for sampling. Each well was allowed to recover prior to sampling. Groundwater samples were collected using a separate disposable bailer for each well, and were transferred into the appropriate containers supplied by the laboratory for analysis. The samples were labeled, stored under refrigerated conditions, and transported under Chain-of-Custody to AS. All samples were collected following Standard Soil and Water Sampling Procedures and QA/QC Protocol. Information obtained during sampling was recorded on field sampling forms from which Well Purge Records were generated, copies of which are presented in Appendix C. The groundwater generated during the recent well sampling activities is stored at the site in 55-gallon UN/DOT-approved drums, pending disposal.

#### **Well Survey**

The tops of the new monitoring well casings were surveyed on March 9, 2005 under the supervision of a California licensed land surveyor to 0.01 feet to determine their elevations relative to mean sea level. A copy of the well survey report is presented in Appendix D. In addition, the latitude and longitude of the monitoring wells has been determined to within 1 meter. The surveyed monitoring well elevations and monitoring well locations will be submitted electronically to the State Department of Water Resources Geotracker database.

#### **Laboratory Analysis**

The groundwater samples collected and submitted for analysis from the previously existing and newly installed wells were analyzed for TPH-g by EPA Method 5030/8015M, and for BTEX and MTBE by EPA Method 8020.

#### **Soil Analytical Results**

TPH-g was detected at a concentration of 68 mg/kg in the MW-12@7.0' sample; BTEX constituents were detected at concentrations of 0.15 mg/kg benzene, 1.1 mg/kg ethylbenzene, and 5.5 mg/kg xylenes in the MW-12@7.0' sample, and ethylbenzene at a concentration of 0.0024 mg/kg in the MW-11@6.0' sample and 0.0021 mg/kg in the MW-12@11.0' sample. Lead (Pb) was detected at a concentration of 3.8 mg/kg in the MW-12@7.0' sample. The additional target analytes were not detected above the laboratory report detection limit (RDL) in any of the other samples. Soil analytical results for TPH-g are contoured on Figures 7 and 8 and are summarized in Table 5.

# 2<sup>nd</sup> Quarter 2005 Groundwater Monitoring and Sampling Event

#### **Groundwater Monitoring**

Depth to groundwater measurements were collected from each of the project monitoring wells (MW-1 through MW-13) on May 5, 2005. Depth to groundwater measurements in the shallow wells ranged from approximately 3 to 5 feet bgs. Depth to groundwater in MW-4D was 46.49 feet bgs and in MW-10D was 46.19 feet bgs. The depth-to-groundwater measurements for the shallow wells were combined with the well casing elevations to determine the groundwater flow direction and gradient. Casing and groundwater elevations are reported in feet relative to mean sea level. Depths to groundwater are expressed in feet. For the 2<sup>nd</sup> Quarter 2005 sampling event, the shallow groundwater flow direction (excluding MW-3 for which the depth to groundwater measurement appeared to be anomalous) for the shallow wells was interpolated to be SSE at a calculated gradient of 0.009. A deep groundwater flow direction could not be calculated as only two deep wells are present, however, these tow wells indicate a southerly component to the flow direction.

#### **Groundwater Sampling**

After depth to groundwater measurements were collected, each well was checked for the presence of free product by subjective evidence and using an oil/water interface probe. The field technician reported the presence of free product in MW-9 and the well was not sampled during this sampling event. The wells were then purged of approximately 3 wetted well casing volumes of groundwater, or at least 5 gallons, whichever was greater, or until they went dry, using a submersible pump. Temperature, pH, conductivity, turbidity, and dissolved oxygen were measured during purging to help demonstrate that fresh groundwater was entering the well casing for sampling. Each well was allowed to recover prior to sampling. Groundwater samples were collected using a separate disposable bailer for each well, and were transferred into the appropriate containers supplied by the laboratory for analysis. The samples were labeled, stored under refrigerated conditions, and transported under Chain-of-Custody to AS. All samples were collected following Standard Soil and Water Sampling Procedures and QA/QC Protocol. Information obtained during sampling was recorded on field sampling forms from which Well Purge Records were generated, copies of which are presented in Appendix C. The groundwater generated during the recent well sampling activities is stored at the site in 55-gallon UN/DOT-approved drums, pending disposal.

#### **Laboratory Analysis**

The groundwater samples collected and submitted for analysis from the 2<sup>nd</sup> Quarter 2005 sampling event were analyzed for TPH-g by EPA Method 5030/8015M, and for BTEX and MTBE by EPA Method 8020.

#### Site Conceptual Model Geology and Hydrology

The Site is situated within the Santa Rosa Plain which consists primarily of silts, sands, and clays associated with alluvial and lacustrine deposits. The lithologic information generated from drilling programs at the site indicates a thin layer of baserock (fill material) which is approximately 1-2 feet thick and distributed across the majority of the site. This fill layer is underlain by a thin clay layer which is present at depths ranging from approximately 2 to 6 feet bgs, underlain by a layer of silty sands, sandy silts, and silty sands with gravel which extend to depths ranging from approximately 5 to 15 feet bgs. This lithologic unit is the water-producing unit into which the shallow monitoring wells at the site are screened. This layer is underlain by a clay layer which extends down to an approximate depth of 40 feet bgs, at which point silty sands, sandy silts, and silty sands with gravel have been identified to the maximum depth explored of approximately 60 feet bgs. This layer is the lithologic unit into which the deep monitoring wells at the site are screened (Figure 9, Geologic Setction A-A').

The shallow groundwater at the site has ranged from depths of approximately 2.5 to 9 feet bgs. The shallow groundwater flow direction at the site has been primarily south/southeasterly at gradients ranging from 0.003 to 0.01 (Figure 3 and Table 4). The groundwater levels in MW-4D and MW-10D range from approximately 42 to 48 feet bgs and indicate a southerly component to the flow direction.

## **Discussion – Initial Sampling of New Wells (1st Quarter 2005)**

TPH-g was detected in each of the groundwater samples collected from the newly installed wells (MW-10D, MW-11, MW-12 and MW-13) at concentrations of 6,000 ug/L, 17,000 ug/L, 33,000 ug/L, and 240 ug/L, respectively. BTEX constituents were detected in each of the newly installed wells at concentrations ranging from 5.1 ug/L benzene in MW-10D to 3,300 ug/L xylenes in MW-12. MTBE was detected in the samples collected from MW-10D, MW-11, and MW-12 at concentrations of 42 ug/L, 130 ug/L, and 270 ug/L, respectively, and was below the laboratory RDL (2.5 ug/L) in the sample collected from MW-13. The groundwater analytical results from the previously existing wells (MW-1 through MW-9) were generally consistent with those from previous events with a TPH-g impact concentrated in the vicinity of MW-5 and MW-9 adjacent to the former gasoline UST, and a more widespread groundwater impact by MTBE (Figures 4 and 6). For the February 7, 2005 sampling event, TPH-g was detected at concentrations ranging from 87

ug/L in MW-3 to 280,000 ug/L in MW-9; BTEX constituents at concentrations ranging from 0.55 ug/L benzene in MW-4D to 28,000 ug/L xylenes in MW-9, and MTBE at concentrations ranging from 3.1 ug/L in MW-2 to 1,400 ug/L in MW-9. Based on conversations with the field technician, the sample collected from MW-9 appears to have at least partially consisted of free product, and as such, a confirmation sample was collected from MW-9 on March 21, 2005. The sample collected on March 21, 2005 contained TPH-g at a concentration of 65,000 ug/L, BTEX constituents at a maximum concentration of 3,700 ug/L benzene, and MTBE at a concentration of 23 ug/L.

### Discussion – 2<sup>nd</sup> Quarter 2005

The results of the May 5, 2005 sampling event are generally consistent with those from previous sampling events at the site. TPH-g, BTEX constituents, and MTBE continue to be detected in groundwater beneath the site. The distribution of the site contaminants is illustrated on Figures 4 through 6c. Contaminant concentrations and groundwater elevations versus time are plotted on Diagrams A and B.

The TPH-g concentration data for well MW-10D collected from the second sampling event was approximately half (3,200  $\mu$ /L) of the concentration reported during this initial sampling event (6,000  $\mu$ /L). The elevated detections may be attributed to problems encountered during the installation of the well when the borehole caved in during the setting of the conductor casing. Additional sampling of this well will assist in evaluating the actual concentrations of TPH-g in the deeper water-bearing zone.

#### Recommendations

The extent of soil impact at the site appears to be generally assessed (Figures 7, 8, and 9). As indicated on Figures 4 through 6c, the vertical and horizontal extent of the groundwater impact beneath the site has not been assessed adequately enough to evaluate site remediation options. Additional monitoring points to the south/southwest of MW-12 and to the south/southeast of MW-11 would be necessary to provide further plume assessment. SCS contacted the SCDHS on March 3, 2005 in order to discuss proposing additional shallow and deep monitoring wells at the site. Mr. Radford concurred with SCS' recommendation that a proposal for additional monitoring points be included in this report (SCDHS, 2005). The proposal is detailed in the following work plan.

## **Work Plan for Additional Subsurface Investigation**

#### **Proposed Shallow Monitoring Wells**

SCS proposes to drill six borings, three of which will be shallow, and three of which will be deep, for conversion into monitoring wells at the approximate locations shown on Figures 4 through 6. The borings for the shallow monitoring wells will be drilled to further evaluate the lateral extent of impacted shallow groundwater at the site. The shallow borings will be drilled using either 8-inch or 9-inch diameter hollow stem augers and will be converted into monitoring wells using 2-inch diameter Schedule 40 flush-threaded PVC material. The screened interval in the monitoring wells will consist of 0.010-inch machine-slotted screen and will extend from approximately 5 to 20 feet bgs. The anticipated depth of each boring is approximately 20 feet, with 15 feet of screen in each well. A #2/12 sand or its equivalent will be used to create a filter pack around the screen. The filter pack will be brought to approximately 1 foot above the top of the screen, an approximate 1-foot bentonite seal will be placed on top of the sand filter pack, and the wells will be completed to the surface with a cement seal. Additional well completion details are presented on Figure W.

The PVC well casing in each monitoring well will extend to within 6 inches bgs and will be fitted with a waterproof locking cap. The wells will be protected by traffic-rated, water-tight circular vaults installed approximately ½-inch above grade.

Based on the results of the previous drilling programs, soil samples will be collected and examined for lithology from each of the borings beginning at an approximate depth of 5 feet bgs, and every 5 feet thereafter to a maximum depth of approximately 20 feet bgs. Based on the results of past drilling programs at the site, SCS anticipates collecting approximately two soil samples from each of the borings for analysis (5 feet and 10 feet). The soil samples will be collected following Standard Soil and Water Sampling Procedures and QA/QC Protocol and submitted to a California Department of Health Services certified analytical laboratory for the appropriate analysis. Chain-of-Custody documentation will be maintained at all times.

#### **Proposed Deep Monitoring Wells**

SCS also proposes to drill, sample, and install three deep monitoring wells to provide additional vertical plume assessment and groundwater monitoring at the approximate locations shown on Figure 4. The deep wells will be drilled to a depth of 20 feet and a conductor casing will be set and cemented in place. After the cement has cured around the conductor casing, the well will be extended to a depth currently estimated at 55 feet and screened. The well will be completed in the same manner as the shallow wells with 2-inch PVC casing and screened from approximately 45 to 55 feet bgs. A typical well completion diagram for the deep wells is presented on Figure WC. The

deep wells will be drilled with appropriate available equipment. Typical borehole diameter for the conductor casing may range from 12 to 16 inches, while the conductor casing is typically 8 to 10 inches in diameter. No soil samples are proposed for analysis from the deep well borings as each of the proposed deep monitoring wells will be adjacent to a shallow well for which soil sampling has been proposed or previously collected.

The drilling and sampling equipment will be pressure washed, and detergent washed and rinsed, to prevent cross contamination between borings. The drill cuttings will be placed on and covered with plastic sheeting, pending disposal. The water generated by decontamination, well development, and sampling will be stored at the site in steel 55-gallon UN/DOT-approved drums, pending disposal. Options for the disposal of the soil and groundwater will be evaluated once the soil and groundwater analytical results have been reported. Disposal options may include additional sampling of both soil and groundwater prior to acceptance for disposal.

#### Well Development, Sampling, and Reporting

The monitoring wells will be developed approximately 1 to 3 days after construction. The wells will be developed by using a surge block and a submersible field portable, groundwater purging pump. The wells will be pumped then surged for approximately 35 to 40 strokes to set the filter pack, followed by pumping of the wells until either they go dry or the drilling process water is deemed to have been removed (approximately five wetted well casing volumes). If a well goes dry during pumping but before the calculated amount of water has been extracted, this will be deemed adequate to have removed all the drilling process water.

After development, the wells will be allowed to stabilize for at least one day prior to measuring groundwater levels. The wells will be opened and the groundwater levels will be measured. The wells will be allowed to remain open for 5 to 10 minutes after which the water levels will be measured again. This process will continue until stable readings are obtained in the wells (±0.02 feet in each well). After the wells have stabilized and water level measurements have been made, the wells will be pumped or bailed until approximately 3 to 5 wetted well casing volumes, or at least 5 gallons of groundwater have been removed, whichever is greater, or until the well goes dry, and until successive measurements of pH, temperature, conductivity, turbidity, and dissolved solids/oxygen have generally stabilized (±10% of the prior reading). Measurements will be taken at regular intervals during purging. After purging is completed, the wells will be sampled in the order purged. This sequence will allow for maximum recovery, anticipated to be at least 80% of their original well volume. In high permeability areas, recovery typically approaches 100%. If a well remains dry after purging, it will be allowed to remain open for at least one hour after which an attempt will be made to sample the well. If the well is still dry, an attempt will be made to sample the well on the next day. If the well still has not recovered, the well will be sampled during the next visit to the site by the sampler. This may not occur until the next quarterly monitoring event.

Pre-purge samples will be collected from any well which previously purged dry and did not recover within one hour for sampling. If the well can be purged and sampled during the next scheduled sampling event, the pre-purge sample will be discarded, otherwise, the pre-purge sample will be submitted for analysis. Groundwater samples will then be obtained for laboratory chemical analysis, using a separate disposable bailer for each well, and transferred to the appropriate containers supplied by the laboratory. The water generated by development and sampling will be stored at the site in 55-gallon UN/DOT-approved drums, pending disposal.

The newly installed monitoring wells will be sampled initially and the results presented in a report of investigation. The wells will then be included with the quarterly monitoring program which is in progress at the site. Analytical results will be evaluated after each sampling event to consider the need for additional investigation. A copy of SCS' Standard Soil and Water Sampling Procedures and QA/QC Protocol is attached.

#### **Well Survey**

The top of each new monitoring well casing will be surveyed under the supervision of a California licensed surveyor or a licensed civil engineer with surveying experience to 0.01 feet to determine its elevation relative to mean sea level. In addition, the latitude and longitude of each monitoring well will be determined to within 1 meter. The surveyed monitoring well elevations and monitoring well locations will be submitted electronically to the State Department of Water Resources Geotracker database.

#### **Laboratory Analysis**

The soil and groundwater samples collected and submitted for analysis during this investigation will be analyzed for TPH-g by EPA Method 8015M, and for BTEX and MTBE by EPA Method 8020.

#### Closure

The work proposed herein will be performed upon receipt of SCDHS approval, and upon receipt of the necessary drilling permits and access agreements for work plan implementation. If pre-approval by the USTCF is re-instituted before the drilling event occurs, pre-approval will be requested prior to drilling.

# Attachments File No. 01203340.00

**Figures** 

Figure 1: Site Location Map

Figure 2: Site Plan

Figure 3: Site Plan - Groundwater Flow Direction and Gradient for 02/07/05

Figure 3A: Groundwater Flow Direction and Gradient for 05/05/05

Figure 4: Isoconcentration Map - TPH-g in Shallow Wells for 02/07/05 and Proposed

Monitoring Well Locations

Figure 4A: Isoconcentration Map – TPH-g in Deep Wells for 02/07/05
Figure 4B: Isoconcentration Map – TPH-g in Shallow Wells for 05/05/05
Figure 4C: Isoconcentration Map – TPH-g in Deep Wells for 05/05/05

Figure 5: Isoconcentration Map – Benzene in Shallow Wells for 02/07/05 Figure 5A: Isoconcentration Map – Benzene in Deep Wells for 02/07/05

Figure 5B: Isoconcentration Map – Benzene in Shallow Wells for 05/05/05

Figure 5C: Isoconcentration Map – Benzene in Deep Wells for 05/05/05
Figure 6: Isoconcentration Map – MTBE in Shallow Wells for 02/07/05
Figure 6A: Isoconcentration Map – MTBE in Deep Wells for 02/07/05

Figure 6B: Isoconcentration Map - MTBE in Shallow Wells for 05/05/05 Figure 6C: Isoconcentration Map - MTBE in Deep Wells for 05/05/05

Figure 7: Isoconcentration Map - TPH-g in Soil - <8' Isoconcentration Map - TPH-g in Soil - >8'

Figure 9: Geologic Section A-A'
Figure SRS: Sensitive Receptor Survey
Well Completion Diagram

Figure WC: Well Completion Diagram with Conductor Casing

#### **Diagrams and Tables**

Key to Diagrams and Tables

Diagram A: TPH-g & Groundwater Elevation vs Time – Shallow Wells Diagram B: MTBE & Groundwater Elevation vs Time – Shallow Wells

Table 1: Soil Boring Analytical Results – 1999 to 2003 Table 2: Soil Boring Analytical Results (Groundwater)

Table 3: Soil Boring Analytical Results – 2005
Table 4: Groundwater Flow Direction and Gradient

Table 5: Monitoring Well Groundwater Analytical Results

#### **Appendices**

Appendix A

Unified Soil Classification System Chart and Boring Log Legend

Boring Logs for MW-10D through MW-13

DWR 188 Forms for MW-10D through MW-13

Appendix B

Well Completion Diagrams for MW-10D through MW-13

Appendix C

Well Development Records for February 2 and March 21, 2005

Well Purge Records for February 7, March 21, and May 5, 2005

Appendix D

Well Survey Report dated March 9, 2005

Appendix E

Analytical Sciences Report #5012106 dated January 31, 2005

Analytical Sciences Report #5020801 dated February 28, 2005

Analytical Sciences Report #5032804 dated April 8, 2005

Analytical Sciences Report #5050903 dated May 20, 2005

Appendix F

Soil and Water Sampling Procedures and QA/QC Protocol

# Reference List File No. 01203340.00

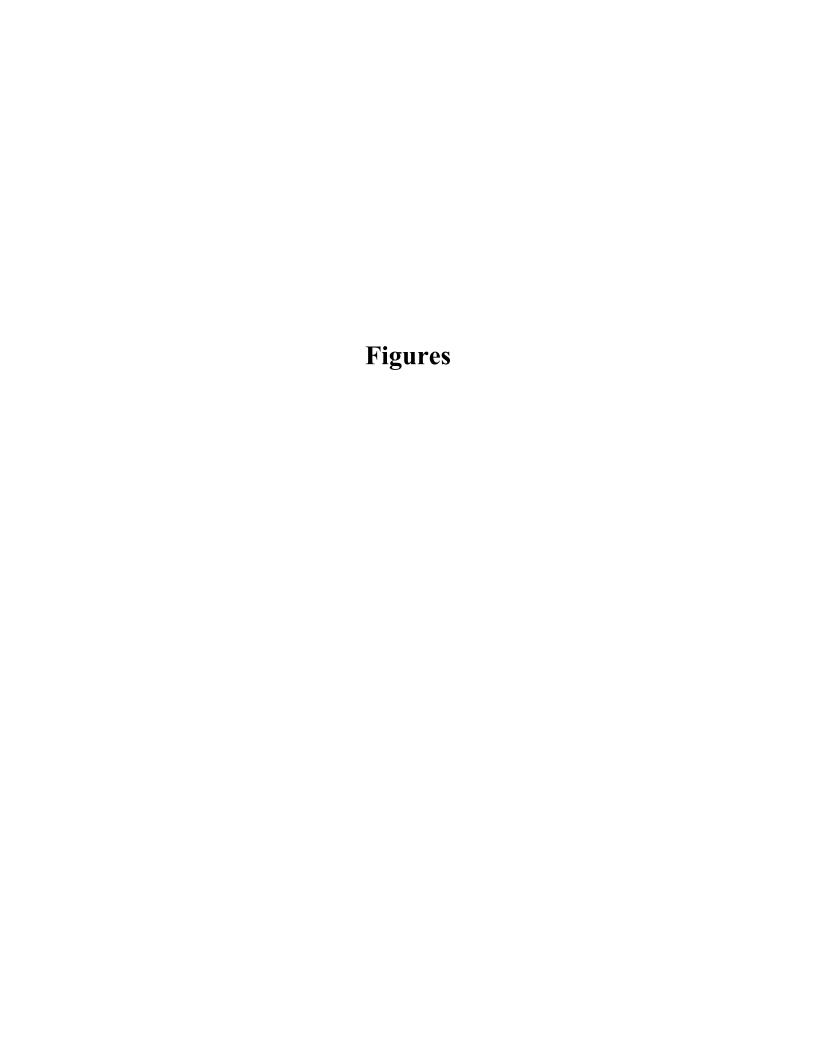
- PNEG, 1998. Work Plan for Soil and Groundwater Investigation at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, January 29.
- PNEG, 1999. Report on Soil and Groundwater Investigation at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, November 15.
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- PNEG, 2001b. Report of Investigation for Soil and Groundwater at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, August 22.
- PNEG, 2001c. Results of the 3<sup>rd</sup> Quarter 2001 Groundwater Monitoring and Sampling Event at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, October 25.
- PNEG, 2002a. Work Plan for Additional Investigation at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, January 10.
- PNEG, 2002b. Results of the 4<sup>th</sup> Quarter 2001 Groundwater Monitoring and Sampling Event at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, February 6.
- PNEG, 2002c. Results of the 1<sup>st</sup> Quarter 2002 Groundwater Monitoring and Sampling Event at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, April 29.

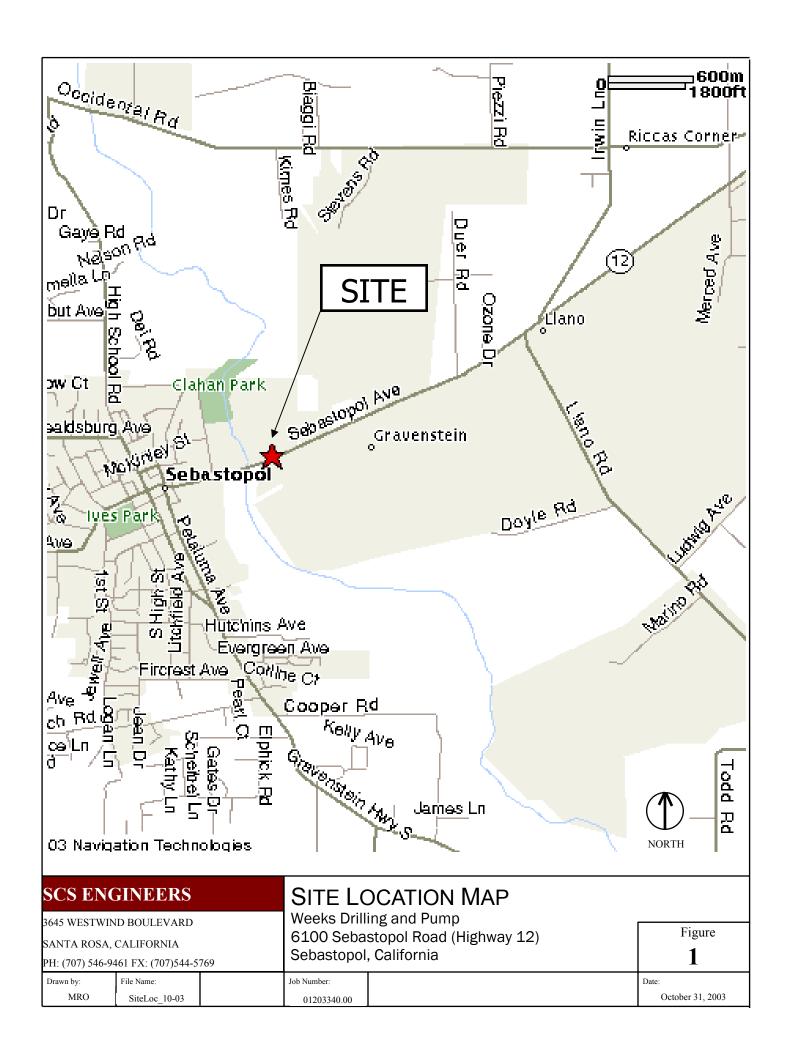
- PNEG, 2002d. Results of the 2<sup>nd</sup> Quarter 2002 Groundwater Monitoring and Sampling Event at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, July 29.
- PNEG, 2002e. Report on Additional Investigation at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, September 27.
- PNEG, 2003a. Results of the 4<sup>th</sup> Quarter 2002 Groundwater Monitoring and Sampling Event at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, January 7.
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- SCDHS, 1998. Unauthorized Release Report, September 16.
- SCDHS, 2004a. Concurrence with recommendation for work plan from D. Radford to W. Thompson, September 10.
- SCDHS, 2004b. Work plan approval from D. Radford to W. Thompson, November 4.
- SCDHS, 2005. Personal communication between D. Radford and K. Coker concurring with inclusion of work plan, March 3.
- SCS, 2003a. Results of the 2<sup>nd</sup> Quarter 2003 Groundwater Monitoring and Sampling Event at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, July 24.
- SCS, 2003b. Report on Additional Monitoring Well Installation and 3<sup>rd</sup> Quarter 2003 Groundwater Monitoring and Sampling Event at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, November 11.
- SCS, 2003c. Report on Drilling and Sampling of Slant Borings and the Abandonment In-Place of One Underground Storage Tank at Weeks Drilling and Pump, Inc. 6100 Sebastopol Road, Sebastopol, California, November 12.
- SCS, 2004a. Results of the 4<sup>th</sup> Quarter 2003 Groundwater Monitoring and Sampling Event at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, January 16.
- SCS, 2004b. Results of the 1<sup>st</sup> Quarter 2004 Groundwater Monitoring and Sampling Event at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, April 15.
- SCS, 2004c. Results of the 2<sup>nd</sup> Quarter 2004 Groundwater Monitoring and Sampling Event at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, September 1.
- SCS, 2004d. Work Plan for Additional Subsurface Investigation at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, October 11.
- SCS, 2004e. Results of the 3<sup>rd</sup> and 4<sup>th</sup> Quarter 2004 Groundwater Monitoring and Sampling Events at Weeks Drilling and Pump 6100 Sebastopol Road, Sebastopol, California, December 27.

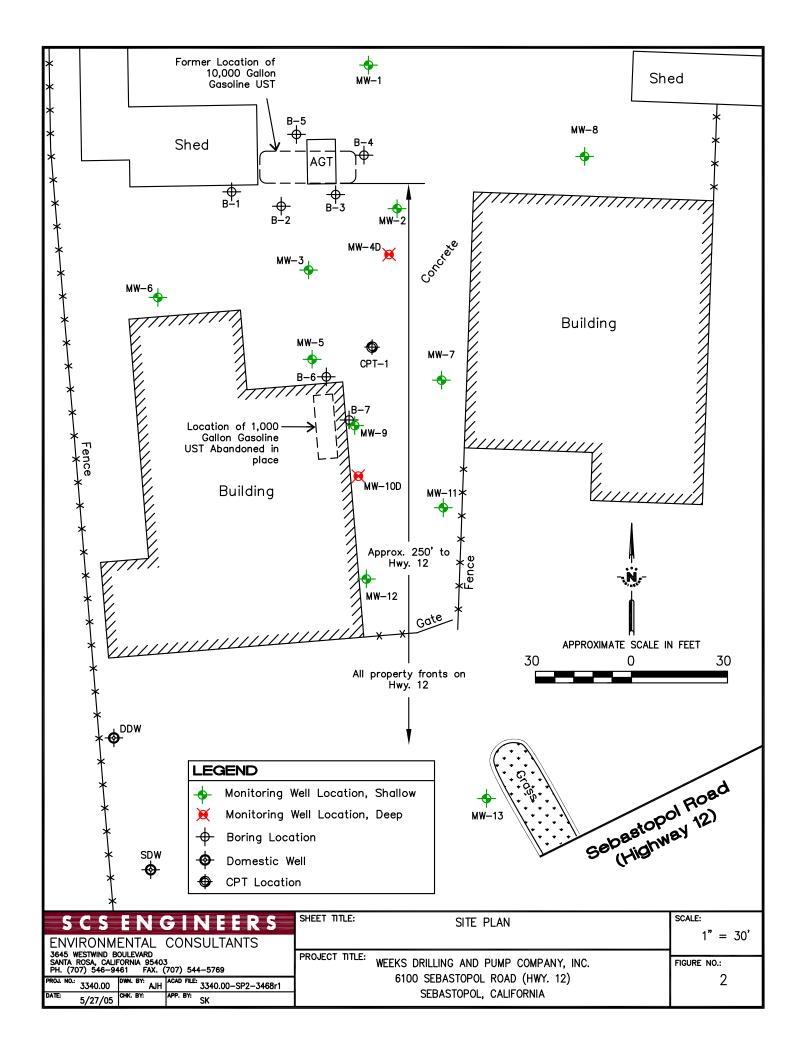
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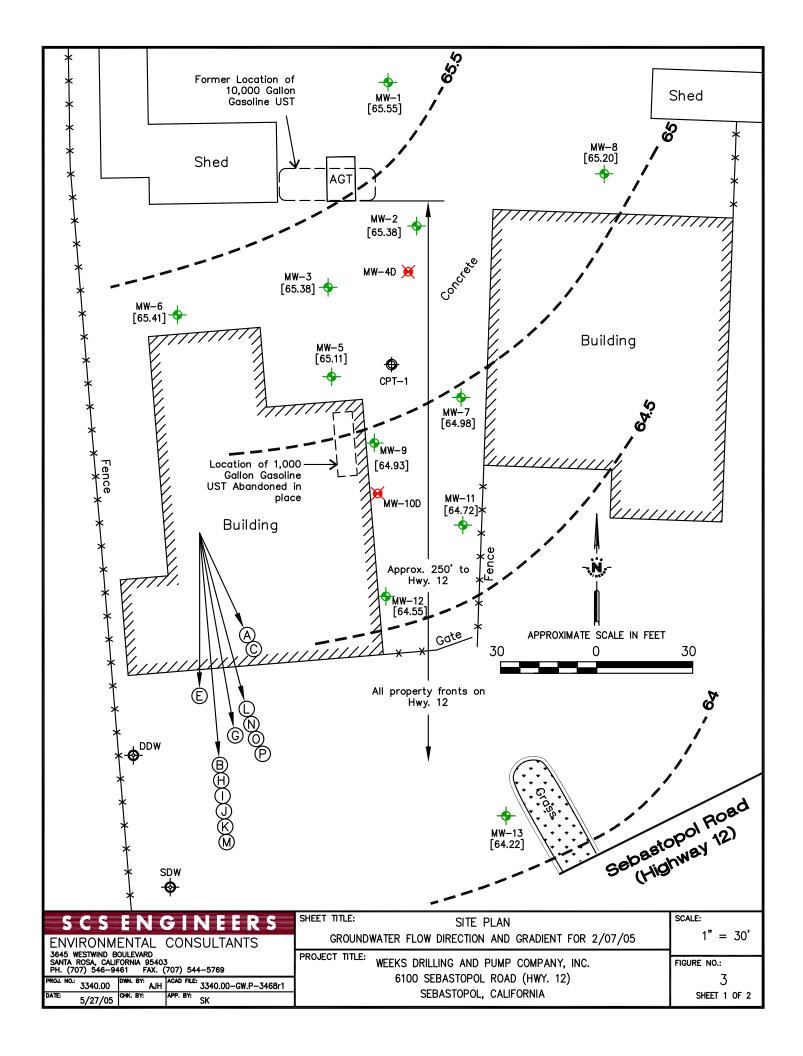
Mr. Ward Thompson Weeks Drilling and Pump 6100 Sebastopol Road Sebastopol, California 95472

Mr. Luis Rivera North Coast Regional Water Quality Control Board 5550 Skylane Boulevard, Suite A Santa Rosa, California 95403

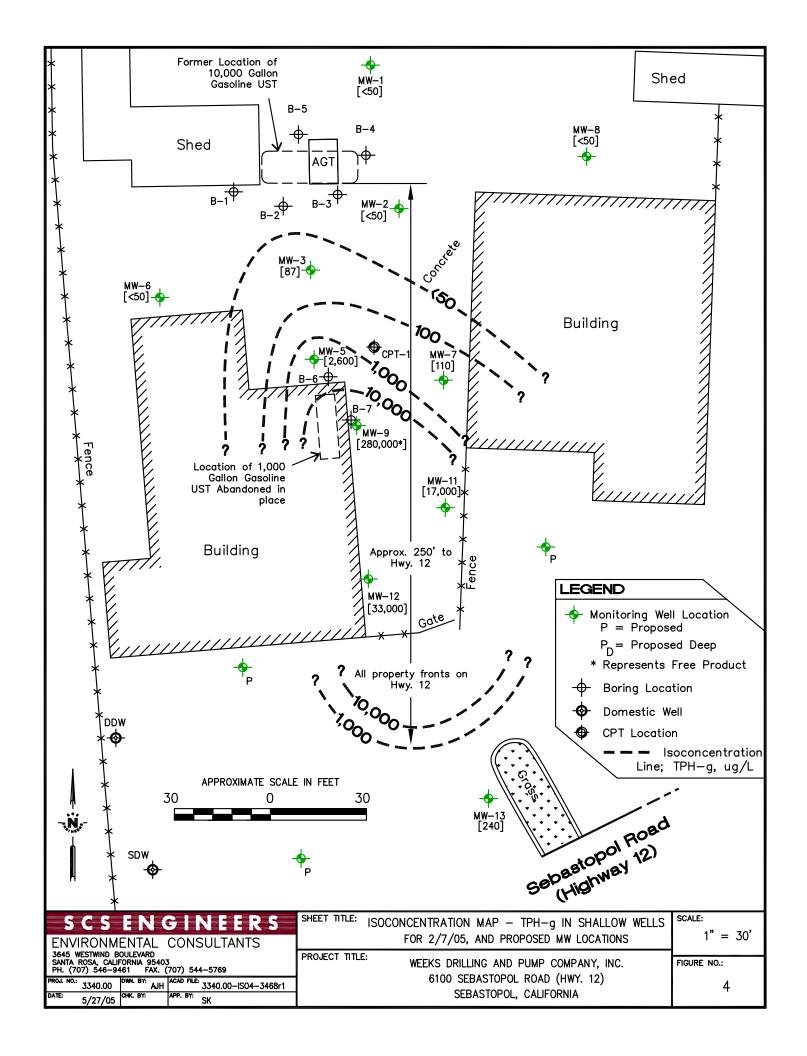


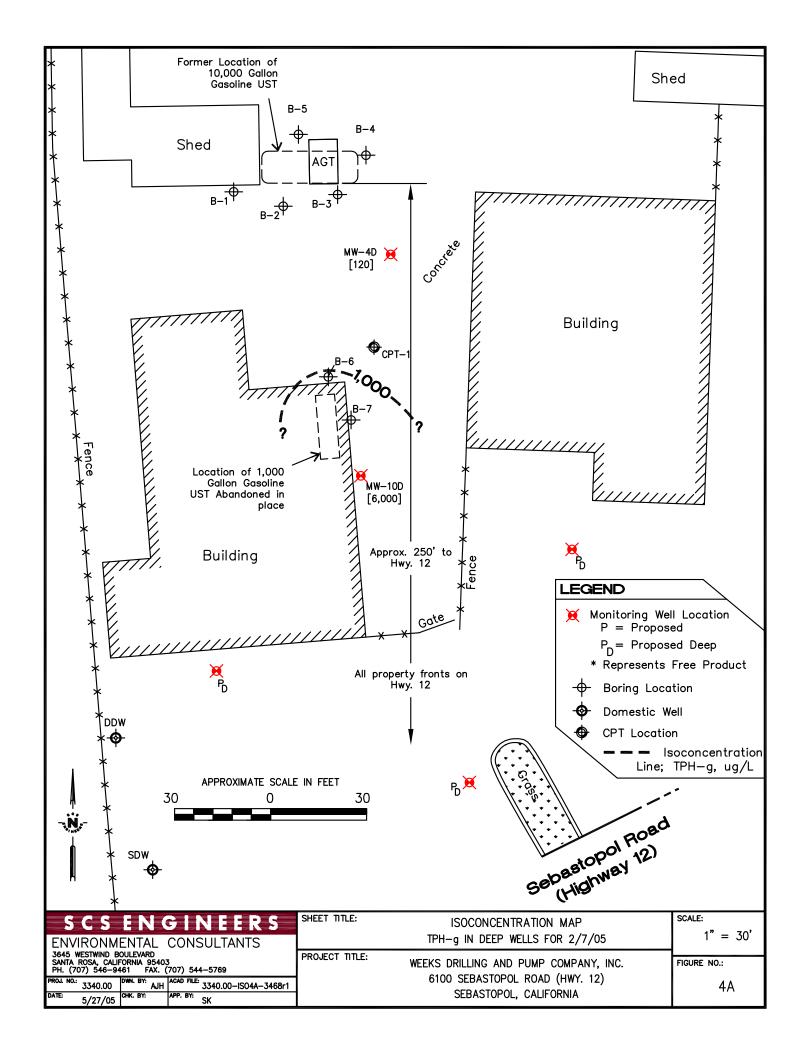


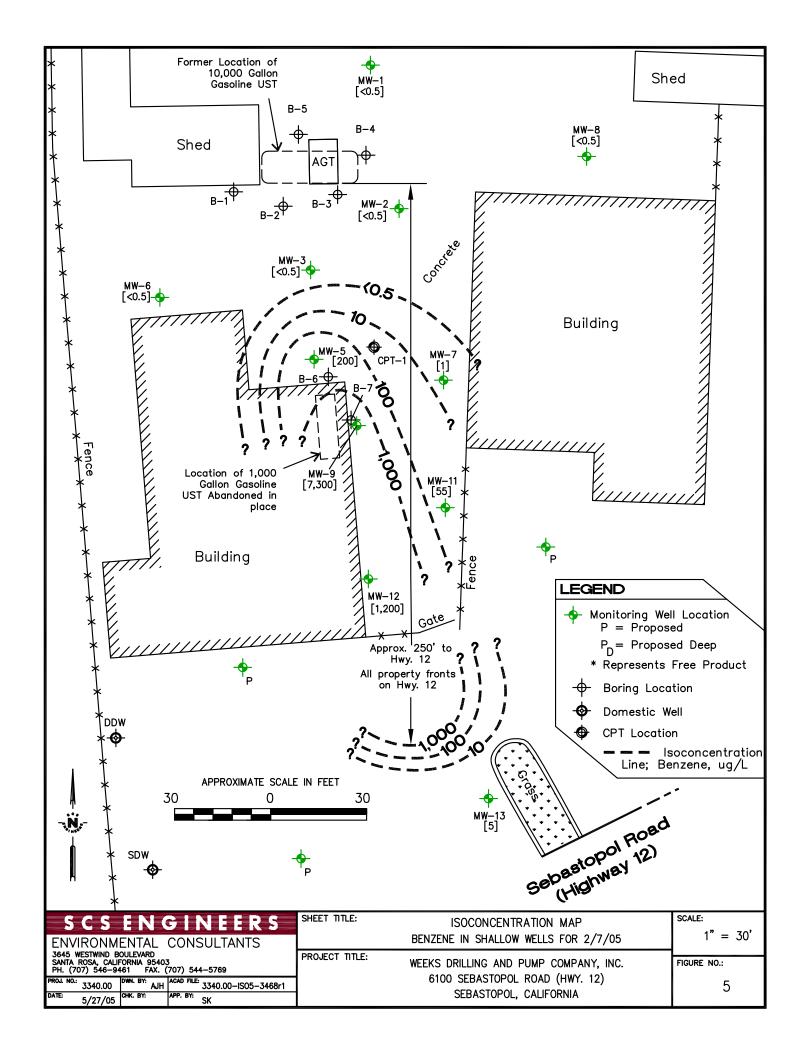


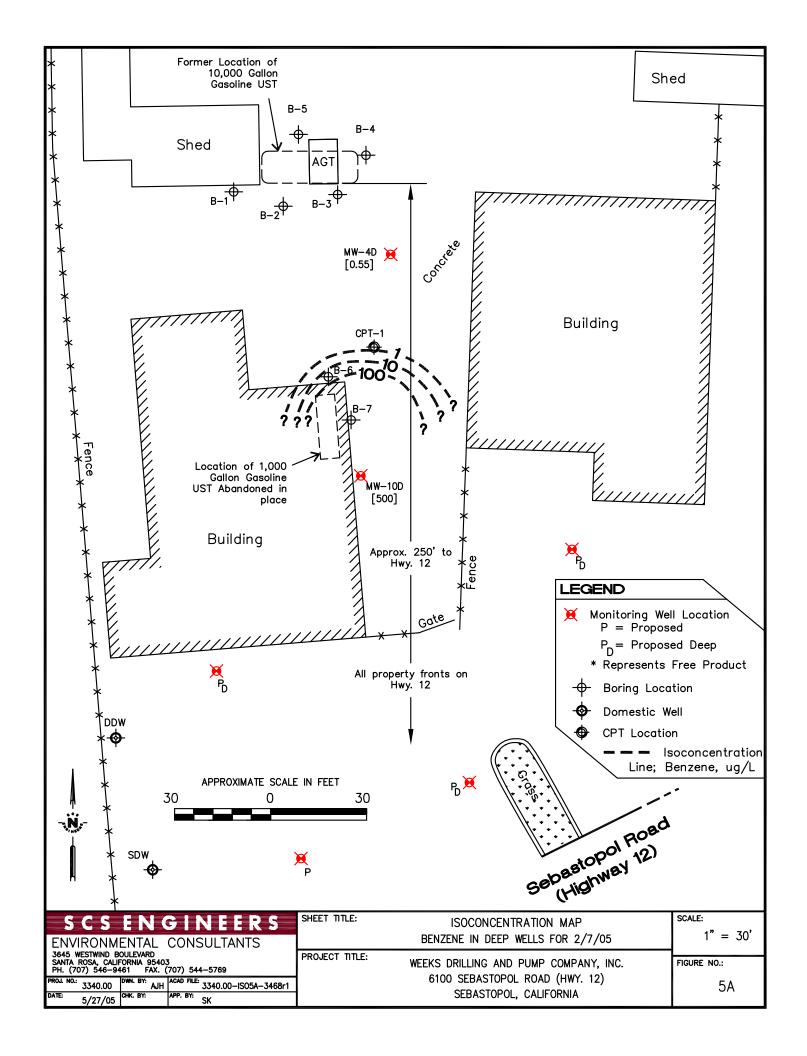


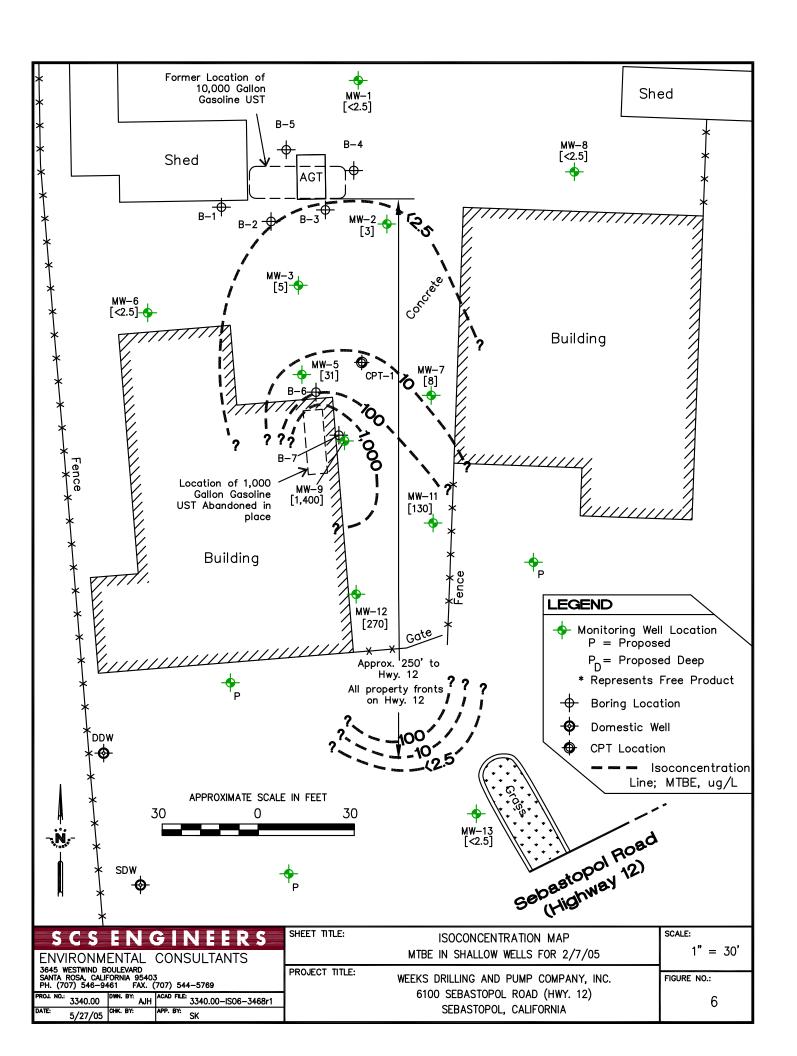
			GRO	NONDW	ATER F	LOW L	EGEN	)
Estimated Groundwater Flow Direction		Gradient Contour (Interval = 0.5 ft)		ldentifier Tag	Date	Est. Flow Direction	Gradient Slope	→ MW-n Monitoring Well Location [XX.XX] Groundwater Elevation
Identifier D		Est. Flow	Gradient					│
Tag	Date	Direction	Slope					Notes:
<u>(A)</u>	6/6/01	S25°E	i = 0.003		-	<u> </u>		Groundwater elevations are in feet
B	9/13/01	S5°E	i = 0.003 $i = 0.005$					above mean sea level (National
<u> </u>	2/21/02	S25°E Not	Not					Geodetic Vertical Datum, 1929).
(E)	5/21/02	Calculated Not	Calculated Not			1		-
<del>- E</del>	8/19/02	Calculated Southerly	i = 0.003					_ → Domestic Well
<u> </u>	11/27/02	SE	i = 0.005					CPT Location
<u> </u>	2/27/03	Southerly	i = 0.003 $i = 0.007$					 —X— Fencing
<u> </u>	6/6/03	Southerly	i = 0.007					- X Fencing
0	9/16/03	Southerly	i = 0.006					
<u>(K)</u>	12/10/03	Southerly	i = 0.01					
<u> </u>	3/15/04	Southerly	i = 0.007					
<u>(M)</u>	6/29/04	Southerly	i = 0.005					
N	9/22/04	SSE	i = 0.003					1
<u> </u>	11/12/04	SSE	i = 0.008					1
<u> </u>	2/07/05	SSE	i = 0.006					1
	2/0//00	33L	1 = 0.000					1
								1
								1
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SC	ENC	LINE	FPC	SHEET TITLE	:	SITF	PLAN	SCALE:
	IMENTAL (			GRO	UNDWATER F			DIENT FOR $2/07/05$ $1" = 30$
645 WESTWIN	D BOULEVARD CALIFORNIA 95403 5-9461 FAX. (7			PROJECT TIT	PANY, INC. FIGURE NO.:			
PH. (707) 546 OJ. NO.: 3340	DWN 8V-	ACAD FILE:	0-GW.P-3468r1		Y. 12) 3			
TE: 5/27		APP. BY:				SEBASTOPO	_, CALIFORNI	A SHEET 2 OF

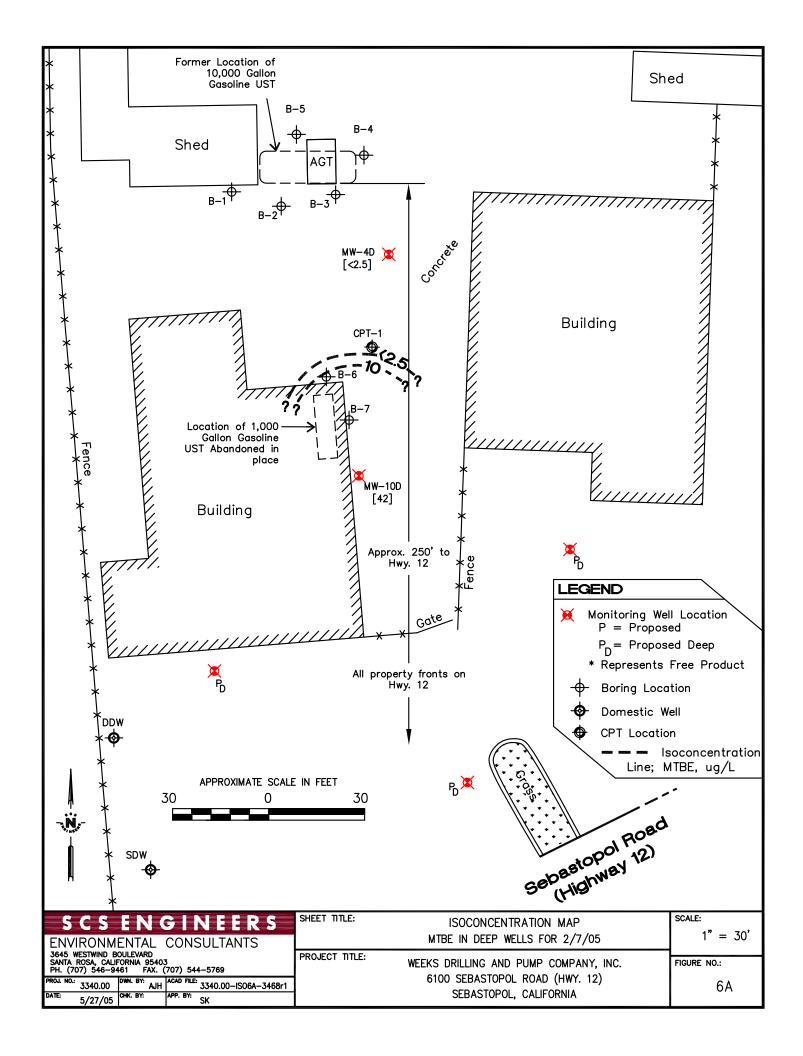


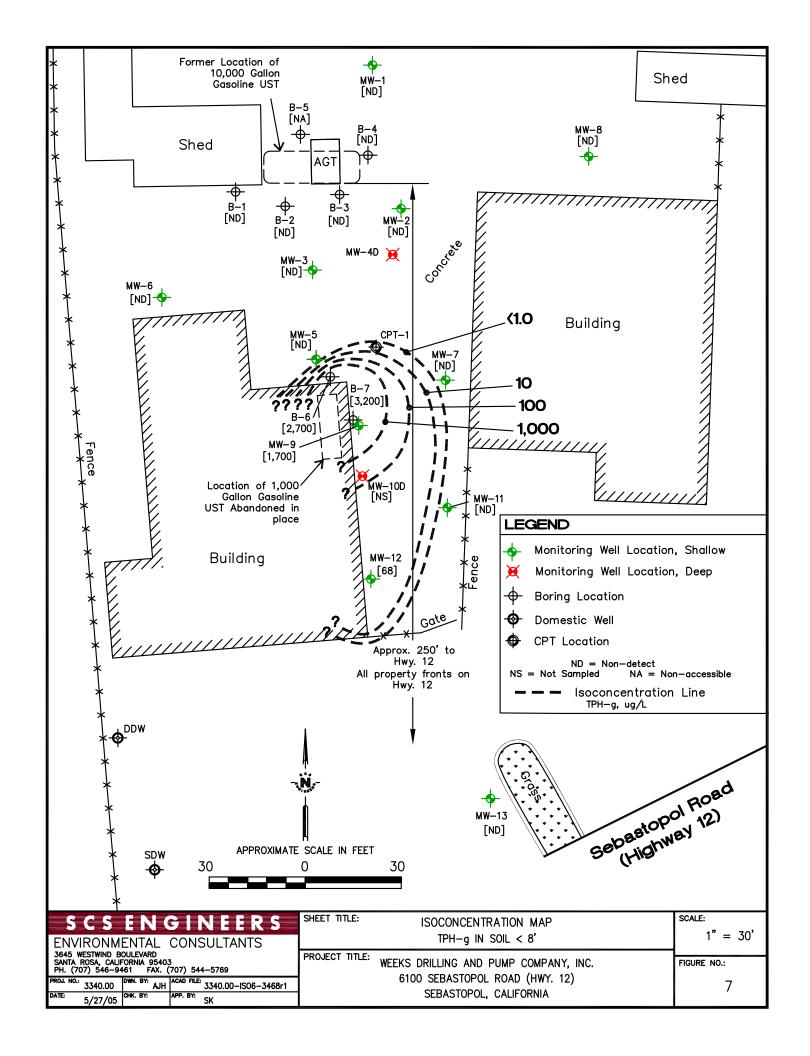


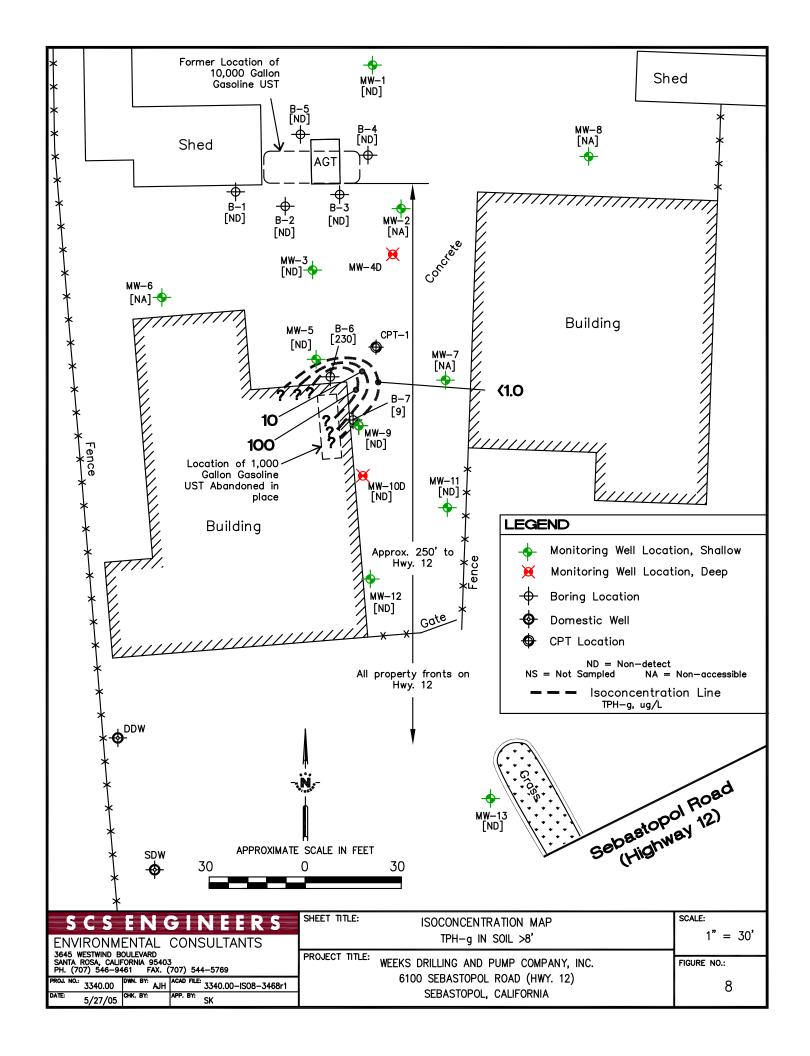


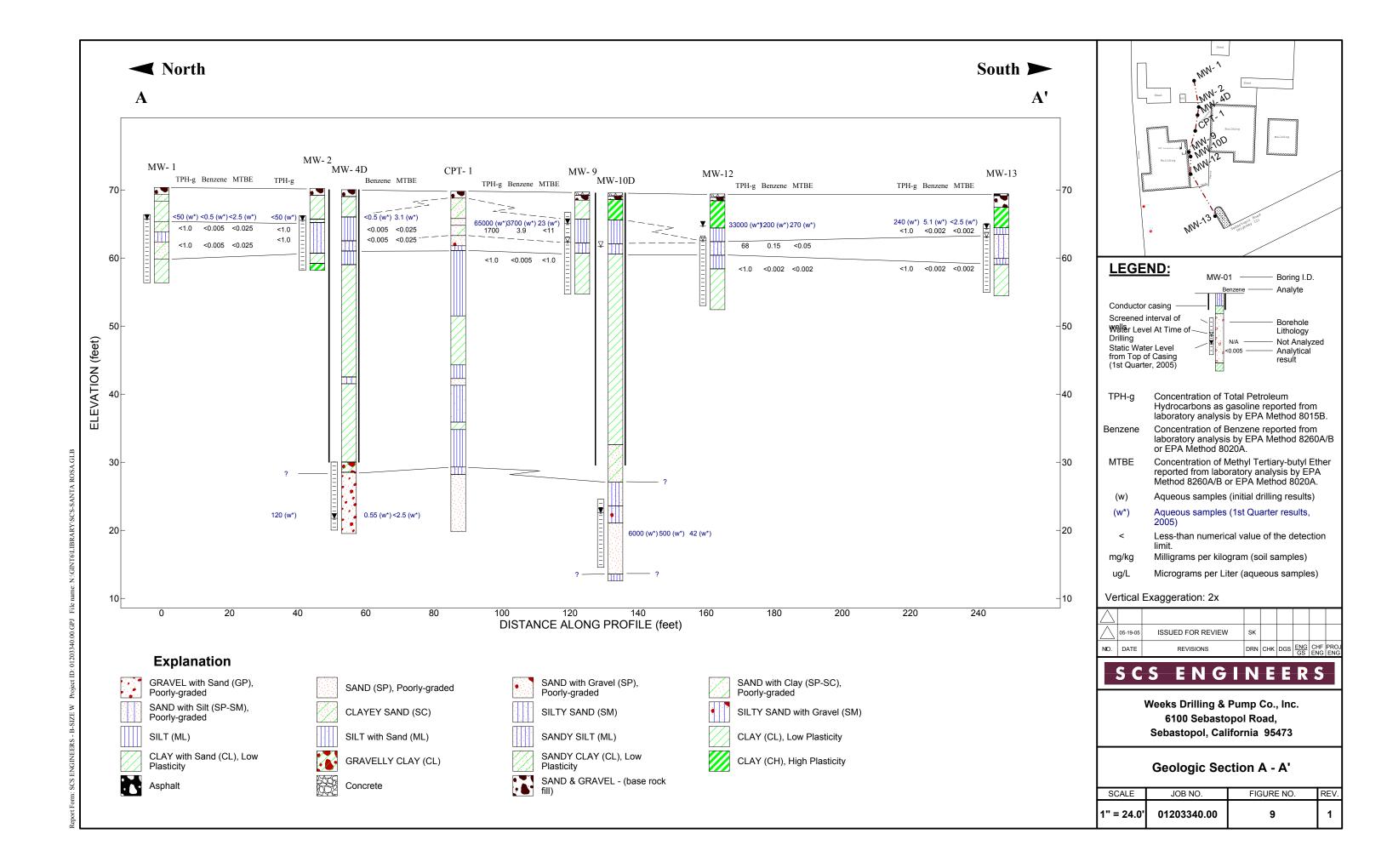


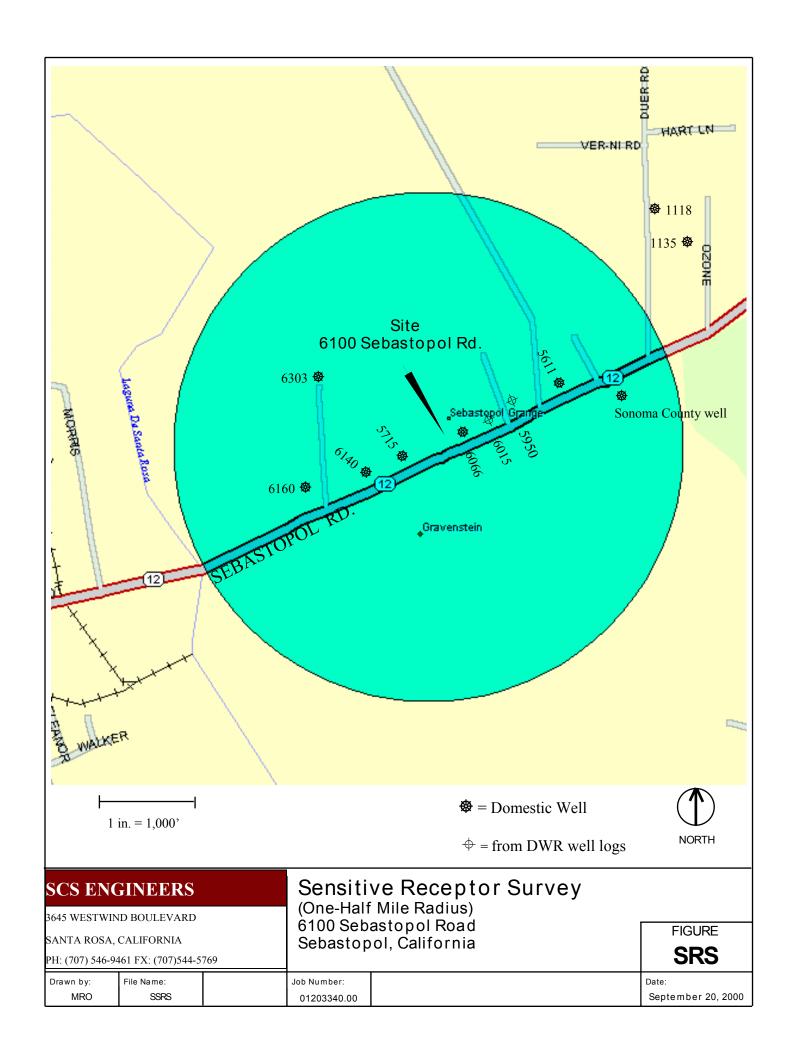


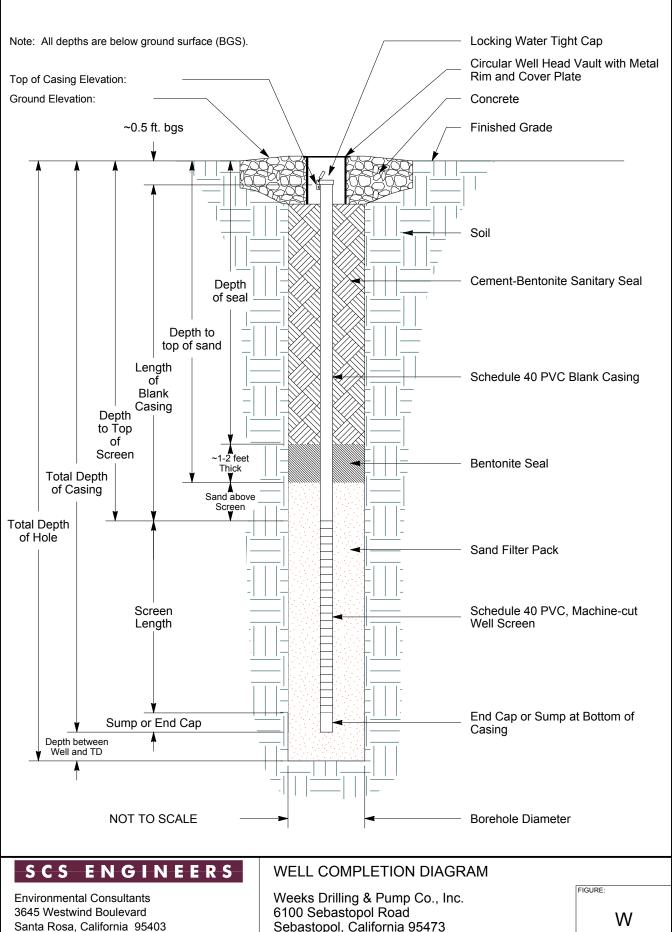






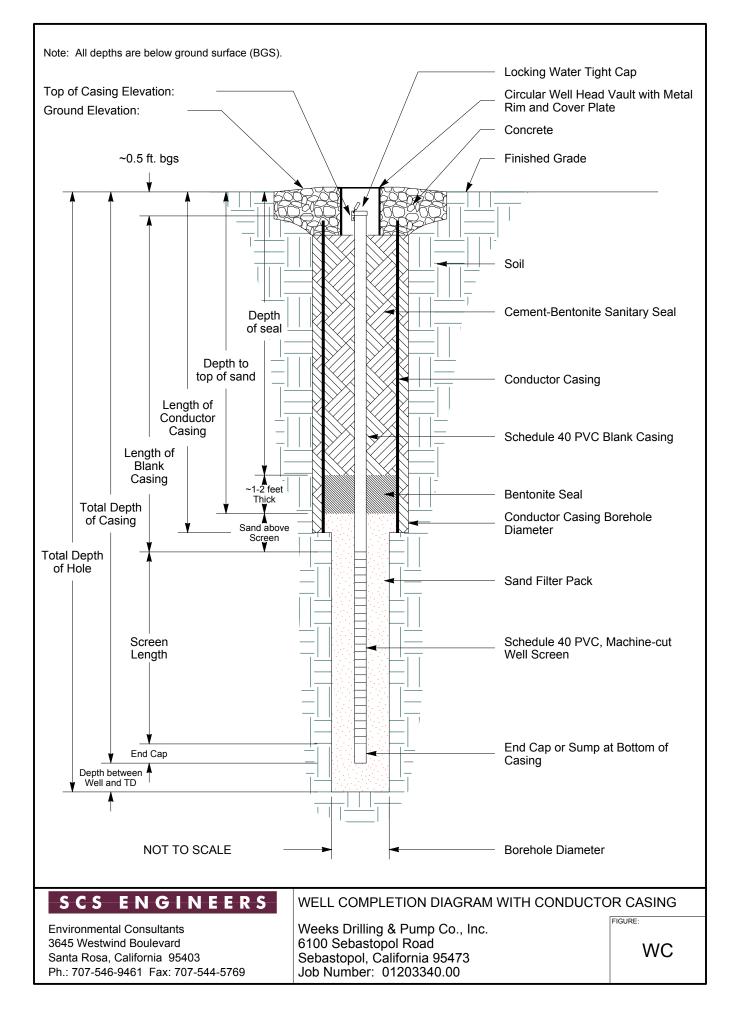


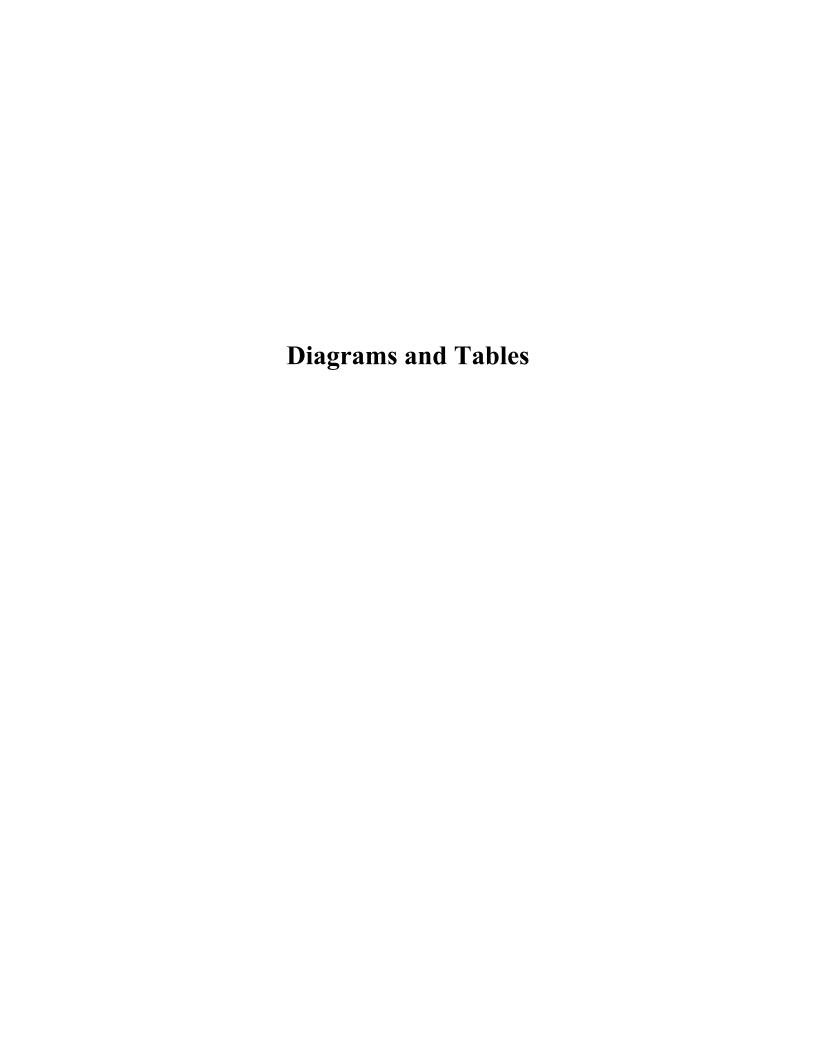




Ph.: 707-546-9461 Fax: 707-544-5769

Sebastopol, California 95473 Job Number: 01203340.00





# **Key to Diagrams and Tables** 6100 Sebastopol Road, Sebastopol

TPH-g = Total petroleum hydrocarbons in the gasoline range

B = Benzene

T = Toluene

E = Ethylbenzene

X = Xylenes

MTBE = Methyl tertiary butyl ether

Other Oxys = diisopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), tert-amyl

methyl ether (TAME), and tert-butyl alcohol (TBA)

4-Oxys = DIPE, ETBE, TAME, TBA

EDC = Ethylene  $dichloride^2$ 

EDB = Ethylene dibromide $^3$ 

CB = Chlorobenzene

1,2-DCB = 1,2-dichlorobenzene

1,3-DCB = 1,3-dichlorobenzene

1,4-DCB = 1,4-dichlorobenzene

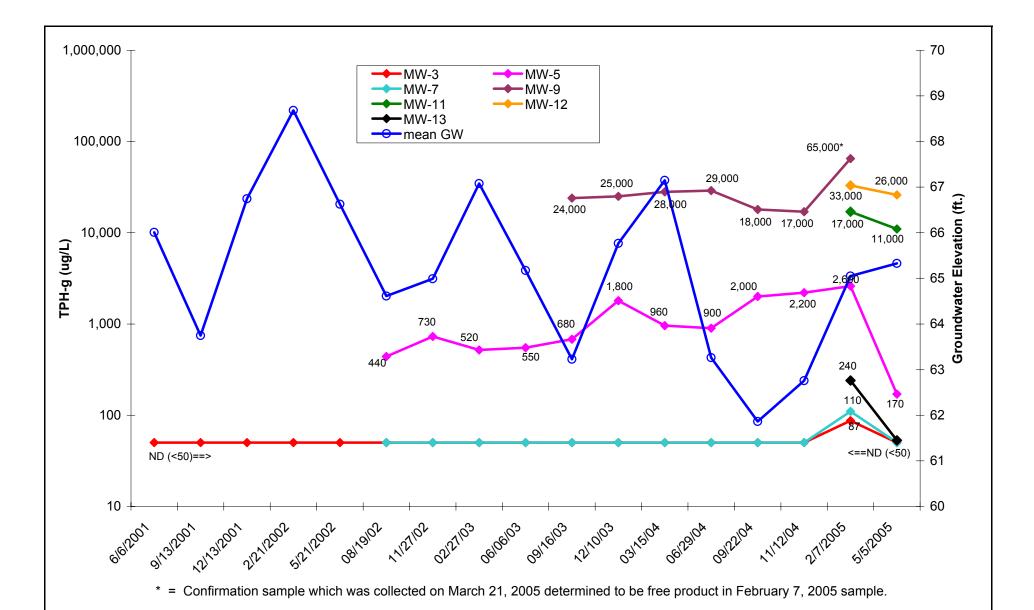
Pb Scavs = Lead scavengers (EDC, EDB)

mg/kg = Milligrams per kilogram

ug/L = Micrograms per liter

<sup>2</sup> EDC has been referred to as 1,2-dichloroethane (1,2-DCA) in previous reports.

<sup>&</sup>lt;sup>3</sup> EDB has been referred to as 1,2-dibromoethane (1,2-DBA) in previous reports.



**SCS ENGINEERS** TPH-g & Groundwater Elevation vs. Time Weeks Drilling & Pump 3645 WESTWIND BOULEVARD

SANTA ROSA, CALIFORNIA PH: (707) 546-9461 FX: (707)544-5769 Drawn By: KLC

File Name: TPH-g-GW

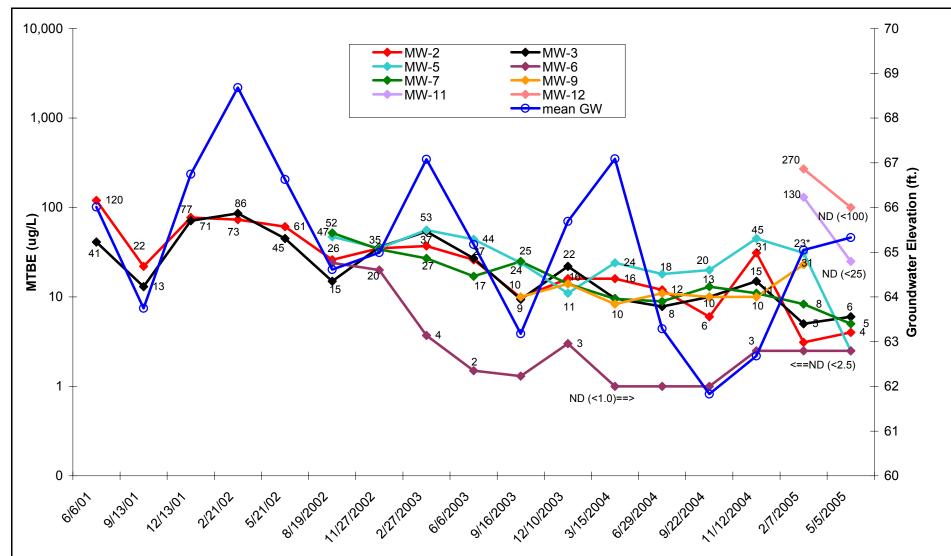
6100 Sebastopol Road Sebastopol, California

Job Number: 01203340.00

**DIAGRAM** 

A

DATE: 05/20/05



\* = Confirmation sample which was collected on March 21, 2005 determined to be free product in sample collected on February 7, 2005.

SCS ENGINEERS	MTBE & Groundwater Elevation vs. Time	DIAGRAM	
3645 WESTWIND BOULEVARD	Weeks Drilling & Pump		
SANTA ROSA, CALIFORNIA	6100 Sebastopol Road	B	
PH: (707) 546-9461 FX: (707)544-5769	Sebastopol, California		
Drawn By: KLC File Name: MTBE-GW Job Number: 01203340.00			

Table 1: Soil Boring Analytical Results - 1999 to 2003 6100 Sebastopol Road, Sebastopol

ID	Date	TPH-g	В	T	E	X	MTBE	Pb
ID	Date				mg/kg			
B-1-5'	07/07/99	<1.0	< 0.005	< 0.005	< 0.005	< 0.005	<1.0	NA
B-1-10'	07/07/99	<1.0	< 0.005	< 0.005	< 0.005	< 0.005	<1.0	NA
B-2-5'	07/07/99	<1.0	< 0.005	< 0.005	< 0.005	< 0.005	<1.0	NA
B-2-10'	07/07/99	<1.0	< 0.005	< 0.005	< 0.005	< 0.005	<1.0	NA
B-3-5'	07/07/99	<1.0	< 0.005	< 0.005	< 0.005	< 0.005	<1.0	NA
B-3-10'	07/07/99	<1.0	< 0.005	< 0.005	< 0.005	< 0.005	<1.0	NA
B-4-5'	07/07/99	<1.0	< 0.005	< 0.005	< 0.005	< 0.005	<1.0	NA
B-4-10'	07/07/99	<1.0	< 0.005	< 0.005	< 0.005	< 0.005	<1.0	NA
B-5-10'	07/07/99	<1.0	< 0.005	< 0.005	< 0.005	< 0.005	<1.0	NA
MW-1-6'	06/01/01	<1.0	< 0.005	< 0.005	< 0.005	< 0.015	< 0.025	NA
MW-1-8.5	06/01/01	<1.0	< 0.005	< 0.005	< 0.005	< 0.015	< 0.025	NA
MW-2-6'	06/01/01	<1.0	< 0.005	< 0.005	< 0.005	< 0.015	< 0.025	NA
MW-2-7.5'	06/01/01	<1.0	< 0.005	< 0.005	< 0.005	< 0.015	< 0.025	NA
MW-3-6.5'	06/01/01	<1.0	< 0.005	< 0.005	< 0.005	< 0.015	< 0.025	NA
MW-3-10.5'	06/01/01	<1.0	< 0.005	< 0.005	< 0.005	< 0.015	< 0.025	NA
MW-5-6'	07/01/02	<1.0	0.011	< 0.005	0.013	< 0.005	<1.0*	NA
MW-5-8'	07/01/02	<1.0	0.024	< 0.005	0.029	0.015	0.010**	NA
MW-6-8'	07/02/02	<1.0	< 0.005	< 0.005	< 0.005	< 0.005	0.014**	NA
MW-7-7'	07/02/02	<1.0	< 0.005	< 0.005	< 0.005	< 0.005	0.010**	NA
MW-8-8"	07/02/02	<1.0	< 0.005	< 0.005	< 0.005	< 0.005	<0.005**	NA
B-6-5'	09/04/03	2,700	2.3	14	27	130	<10	9.0
B-6-10'	09/04/03	230	0.22	< 0.2	0.41	1.2	<1.0	< 5.0
B-6-15'	09/04/03	16	< 0.03	< 0.03	< 0.03	< 0.03	<1.0	7.0
B-7-5'	09/06/03	3,200	6.8	35	41	190	<22	7.6
B-7-10'	09/06/03	8.7	0.08	0.27	0.17	0.59	<1.0	8.6
MW-9-5'	09/06/03	1,700	3.9	3.9	21	62	<11	7.4
MW-9-10'	09/06/03	<1.0	< 0.005	< 0.005	< 0.005	< 0.005	<1.0	8.2

Analysis by EPA Method 8020

\*\*

Other four ether-based oxygenates ND by EPA Method 8260B.

Table 2: Soil Boring Analytical Results (Groundwater) 6100 Sebastopol Road, Sebastopol

ID	Date	TPH-g	В	T	E	X	MTBE	4-Oxys	1,2-DCA	CB	1,3-DCB	1,4-DCB	1,2-DCB	1,2-DBA
ID	Date		μg/L											
B-1	07/07/99	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5 to <5.0	< 0.5	< 0.5	< 0.5	1.2	2.6	< 0.5
B-2	07/07/99	79	< 0.5	< 0.5	< 0.5	< 0.5	67	<0.5 to <5.0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
B-3	07/07/99	51	< 0.5	< 0.5	< 0.5	< 0.5	18	<0.5 to <5.0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
B-4	07/07/99	< 50	< 0.5	< 0.5	< 0.5	< 0.5	30	<0.5 to <5.0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
B-5	07/07/99	< 50	< 0.5	< 0.5	< 0.5	0.61	20	<0.5 to <5.0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Table 3: Soil Boring Analytical Results - 2005 6100 Sebastopol Road, Sebastopol

ID	Date	TPH-g	В	T	E	X	MTBE	DIPE	ETBE	TAME	TBA	Pb
110	Date							mg/kg				
MW-11 @ 6.0'	01/19/05	<1.0	< 0.002	< 0.002	0.0024	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.05	NA
MW-11 @ 11.0'	01/19/05	<1.0	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.05	NA
MW-12 @ 7.0'	01/20/05	68	0.15	< 0.05	1.1	5.5	< 0.05	< 0.05	< 0.05	< 0.05	<1.0	3.8
MW-12 @ 11.0'	01/20/05	<1.0	< 0.002	< 0.002	0.0021	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.05	NA
MW-13 @ 6.0'	01/20/05	<1.0	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.05	NA
MW-13 @ 11.0'	01/20/05	<1.0	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.05	NA

Table 4: Groundwater Flow Direction and Gradient 6100 Sebastopol Road, Sebastopol

Well#	Date	Top of Casing Elevation (feet > msl)	Depth to Groundwater (feet)	Water Level Elevation (feet > msl)	Groundwater Flow Direction & Gradient (i)
MW-1		71.49	5.35	66.14	S25°E
MW-2	06/06/01	71.2	5.22	65.98	i = 0.003
MW-3		71.12	5.21	65.91	1 0.003
MW-1		71.49	7.62	63.87	S5°E
MW-2	09/13/01	71.2	7.48	63.72	i = 0.003
MW-3		71.12	7.47	63.65	1 - 0.003
MW-1		71.49	4.63	66.86	S25°E
MW-2	12/13/01	71.2	4.51	66.69	i = 0.005
MW-3		71.12	4.44	66.68	1 - 0.003
MW-1		71.49	Well inac	ccessible	
MW-2	02/21/02	71.2	2.49	68.71	Not Calculated
MW-3		71.12	2.47	68.65	
MW-1		71.49	Well inac	ccessible	
MW-2	05/21/02	71.2	4.57	66.63	Not Calculated
MW-3		71.12	4.5	66.62	
MW-1		71.49	6.52	64.97	
MW-2		71.2	6.48	64.72	7
MW-3		71.12	6.49	64.63	
MW-4D	08/19/02	70.99	41.92	29.07	Southerly
MW-5	08/19/02	70.82	6.48	64.34	i = 0.003
MW-6		70.88	6.35	64.53	
MW-7		71.17	6.8	64.37	
MW-8		72.32	7.59	64.73	
MW-1		71.49	6.24	65.25	
MW-2		71.2	6.14	65.06	
MW-3		71.12	6.12	65	
MW-4D	11/27/02	70.99	42.23	28.76	Southeast
MW-5	11/27/02	70.82	5.99	64.83	i = 0.005
MW-6		70.88	5.88	65	
MW-7		71.17	6.38	64.79	
MW-8		72.32	7.31	65.01	
MW-1		69.87	2.51	67.36	
MW-2		69.61	2.41	67.2	_
MW-3		69.55	2.43	67.12	
MW-4D	02/27/03*	69.43	41.88	27.55	Southerly
MW-5	0=,= 1, 05	69.25	2.45	66.8	i = 0.007
MW-6		69.32	2.25	67.07	_
MW-7		69.6	2.77	66.83	_
MW-8		70.74	3.58	67.16	
MW-1		69.87	4.39	65.48	_
MW-2		69.61	4.31	65.3	_
MW-3		69.55	4.34	65.21	
MW-4D	06/06/03	69.43	43.06	26.37	Southerly
MW-5		69.25	4.31	64.94	i = 0.007
MW-6		69.32	4.19	65.13	4
MW-7		69.6	4.7	64.9	-
MW-8		70.74	5.49	65.25	

<sup>\*</sup> Monitoring wells re-surveyed to msl on January 30 and February 4, 2003.

Table 4: Groundwater Flow Direction and Gradient 6100 Sebastopol Road, Sebastopol

		Top of Casing	Depth to	Water Level	Groundwater Flow
Well#	Date	Elevation	Groundwater	Elevation	Direction & Gradient
VVCII II	Date	(feet > msl)	(feet)	(feet > msl)	(i)
MW-1		69.87	6.35	63.52	(-)
MW-2		69.61	6.27	63.34	7
MW-3		69.55	6.31	63.24	
MW-4D		69.43	43.27	26.16	
MW-5	09/16/03**	69.25	6.26	62.99	Southerly
MW-6		69.32	6.17	63.15	i = 0.006
MW-7	1	69.60	6.60	63.00	7
MW-8		70.74	7.38	63.36	
MW-9	1	69.49	6.66	62.83	
MW-1		69.87	3.78	66.09	
MW-2	1	69.61	3.81	65.80	
MW-3	1	69.55	3.46	66.09	
MW-4D		69.43	43.91	25.52	C (1,1, -
MW-5	12/10/03	69.25	3.73	65.52	Southerly
MW-6	1	69.32	3.30	66.02	i = 0.01
MW-7	1	69.60	4.31	65.29	
MW-8	1	70.74	5.18	65.56	
MW-9		69.49	4.35	65.14	
MW-1		69.87	2.39	67.48	
MW-2	1	69.61	2.32	67.29	
MW-3	<u> </u>	69.55	2.39	67.16	
MW-4D	1	69.43	44.36	25.07	Southerly
MW-5	03/15/04	69.25	2.40	66.85	i = 0.007
MW-6		69.32	2.26	67.06	1 – 0.007
MW-7		69.60	2.69	66.91	
MW-8		70.74	3.46	67.28	
MW-9		69.49	2.81	66.68	
MW-1		69.87	6.35	63.52	
MW-2		69.61	6.24	63.37	
MW-3		69.55	6.27	63.28	
MW-4D		69.43	45.11	24.32	Southerly
MW-5	06/29/04	69.25	6.19	63.06	i = 0.005
MW-6		69.32	6.07	63.25	
MW-7		69.60	6.59	63.01	4
MW-8		70.74	7.40	63.34	4
MW-9		69.49	6.02	63.47	
MW-1		69.87	7.93	61.94	
MW-2		69.61	7.76	61.85	_
MW-3		69.55	7.32	62.23	4
MW-4D	09/22/04	69.43	46.90	22.53	South-Southeast
MW-5		69.25	7.54	61.71	i = 0.003
MW-6		69.32	7.54	61.78	4
MW-7		69.60	7.90	61.70	4
MW-8		70.74	8.91	61.83	4
MW-9		69.49	7.89	61.60	

<sup>\*\*</sup> Monitoring wells re-surveyed to msl on January 30 and February 4, 2003.

Table 4: Groundwater Flow Direction and Gradient 6100 Sebastopol Road, Sebastopol

		Top of Casing	Depth to	Water Level	Groundwater Flow
Well#	Date	Elevation	Groundwater	Elevation	Direction & Gradient
		(feet > msl)	(feet)	(feet > msl)	(i)
MW-1		69.87	6.82	63.05	
MW-2		69.61	6.91	62.70	
MW-3		69.55	6.72	62.83	
MW-4D		69.43	47.59	21.84	South-Southeast
MW-5	11/12/04	69.25	6.81	62.44	i = 0.008
MW-6		69.32	5.76	63.56	1 – 0.008
MW-7		69.60	7.34	62.26	
MW-8		70.74	8.27	62.47	
MW-9		69.49	7.37	62.12	
MW-1		69.87	4.32	65.55	
MW-2		69.61	4.23	65.38	
MW-3		69.55	4.17	65.38	
MW-4D	02/07/05	69.43	47.80	21.63	
MW-5		69.25	4.14	65.11	
MW-6		69.32	3.91	65.41	South-Southeast
MW-7		69.60	4.62	64.98	i = 0.006*
MW-8		70.74	5.54	65.20	1 – 0.000
MW-9		69.49	4.56	64.93	
MW-10D		69.16	D	ry	
MW-11		69.19	4.47	64.72	
MW-12		69.06	4.51	64.55	
MW-13		68.95	4.73	64.22	
MW-1		69.87	3.78	66.09	
MW-2		69.61	3.88	65.73	
MW-3		69.55	4.76	64.79	
MW-4D		69.43	46.49	22.94	
MW-5		69.25	3.85	65.40	
MW-6		69.32	3.16	66.16	South-Southeast
MW-7	05/05/05 D	69.60	4.28	65.32	i = 0.009**
MW-8		70.74	5.02	65.72	1 – 0.009
MW-9		69.49	4.39	65.10	
MW-10D		69.16	46.19	22.97	
MW-11		69.19	4.18	65.01	
MW-12		69.06	4.26	64.80	
MW-13		68.95	4.69	64.26	

Note: Groundwater flow direction rounded to nearest 5 degrees, excluding MW-4D and MW-10D.

<sup>\*</sup> Excluding deep wells MW-4D and MW-10D.

<sup>\*\*</sup> Excluding deep wells MW-4D and MW-10D and MW-3.

Table 5: Monitoring Well Groundwater Analytical Results 6100 Sebastopol Road, Sebastopol

ID	Date	TPH-g	В	T	E	X	Other Oxys	MTBE	Pb Scavs
ID	Date				μ	g/L			
	06/06/01	ND	ND	ND	ND	ND	ND	ND	ND
	09/13/01	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <50	<1.0	<1.0
	12/13/01	< 50	< 0.5	1.1	0.53	2.5	<1.0 to <25	<1.0	NA
	02/21/02					ble (submerged)			
	05/21/02				Well inaccessil	ble (submerged)			
	08/19/02	< 50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to <10	< 0.5	< 0.5
	11/27/02	< 50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to <10	< 0.5	NA
MW-1	02/27/03	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	<1.0	NA
IVI VV - I	06/06/03	< 50	0.55	< 0.3	< 0.5	< 0.5	<0.5 to <10	< 0.5	NA
	09/16/03	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	<1.0	NA
	12/10/03	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	<1.0	NA
	03/15/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	<1.0	NA
	06/29/04	<50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	<1.0	NA
	11/12/04	<50	< 0.5	< 0.5	< 0.5	<1.5	NA	<2.5	NA
	02/07/05	<50	< 0.5	< 0.5	< 0.5	<1.5	NA	<2.5	NA
	05/05/05	<50	< 0.5	< 0.5	< 0.5	<1.5	NA	<2.5	NA
	06/06/01	120*	ND	ND	ND	ND	ND	120	ND
	09/13/01	<50	<1.0	<1.0	<1.0	<1.0	<1.0 to <50	22	<1.0
	12/13/01	77*	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	77	NA
	02/21/02	<50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to <10	73	< 0.5
	05/21/02	<50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to <10	61	< 0.5
	08/19/02	<50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to<10	26	< 0.5
	11/27/02	<50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to <10	35	NA
	02/27/03	<50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	37	NA
MW-2	06/06/03	<50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to <10	26	NA
	09/16/03	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	9.8	NA
	12/10/03	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	16	NA
	03/15/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	10	NA
	06/29/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	12	NA
	09/22/04	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	6.0	NA
	11/12/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	NA	31	NA
	02/07/05	<50	< 0.5	< 0.5	< 0.5	<1.5	NA	3.1	NA
	05/05/05	<50	< 0.5	< 0.5	< 0.5	<1.5	NA	3.7	NA

Table 5: Monitoring Well Groundwater Analytical Results 6100 Sebastopol Road, Sebastopol

ID	Date	TPH-g	В	T	E	X	Other Oxys	MTBE	Pb Scavs
ID	Date				μį	g/L			-
	6/6/2001	ND	ND	ND	ND	ND	ND	41	ND
	09/13/01	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <50	13	<1.0
	12/13/01	71*	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	71	NA
	02/21/02	< 50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to <10	86	< 0.5
	05/21/02	< 50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to <10	45	< 0.5
	08/19/02	< 50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to<10	15	< 0.5
	11/27/02	< 50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to <10	36	NA
	02/27/03	54*	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	54	NA
MW-3	06/06/03	< 50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to <10	27	NA
	09/16/03	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	9.4	NA
	12/10/03	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	22	NA
	03/15/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	9.6	NA
	06/29/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	7.8	NA
	09/22/04	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	9.9	NA
	11/12/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	NA	15	NA
	02/07/05	87	< 0.5	1.1	< 0.5	3.2	NA	4.7	NA
	05/05/05	< 50	< 0.5	< 0.5	< 0.5	<1.5	NA	5.7	NA
k	Laboratory note	s that the TPH-g	result consists ex	clusively of MT	BE.				
	08/19/02	< 50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to<10	< 0.5	< 0.5
	11/27/02	< 50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to <10	< 0.5	NA
	02/27/03	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	<1.0	NA
	06/06/03	< 50	2.8	0.73	< 0.5	< 0.5	<0.5 to <10	< 0.5	NA
	09/16/03	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	<1.0	NA
MW-4D	12/10/03	< 50	< 0.5	< 0.5	< 0.5	<1.0	<1.0 to <25	<1.0	NA
W W -4D	03/15/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	<1.0	NA
	06/29/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	<1.0	NA
	09/22/04	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	<1.0	NA
	11/12/04				Well v	vas dry			
	02/07/05	120	0.55	< 0.5	< 0.5	2.8	NA	<2.5	NA
	05/05/05	52	1.0	0.5	< 0.5	2.2	NA	<2.5	NA

Table 5: Monitoring Well Groundwater Analytical Results 6100 Sebastopol Road, Sebastopol

ID	Date	TPH-g	В	T	E	X	Other Oxys	MTBE	Pb Scavs
ID	Date				μ <u>ε</u>	g/L			
	08/19/02	440	78	0.5	1.9	7.3	<0.5 to<10	47	< 0.5
	11/27/02	730	200	0.83	4.2	4.8	<0.5 to <10	35	NA
	02/27/03	520	71	<1.0	19	15	<1.0 to <25	53	NA
	06/06/03	550	79	<3.0	30	< 5.0	<5.0 to <100	44	NA
	09/16/03	680	120	1.0	9.4	1.0	<1.0 to <25	24	NA
MW-5	12/10/03	1,800	450	7.5	66	22	<1.0 to <25	11	NA
1V1 VV -3	03/15/04	960	180	2.7	70	8.1	<1.0 to <25	24	NA
	06/29/04	900	110	2.6	10	< 6.0	<1.0 to <25	18	NA
	09/22/04	2,000	480	2.2	74	21	<1.0 to <25	20	NA
	11/12/04	2,200	330	5.3	69	28	NA	45	NA
	02/07/05	2,600	200	< 5.0	120	<15	NA	31	NA
	05/05/05	170	21	< 0.5	14	<1.5	NA	<2.5	NA
	08/19/02	< 50	0.46	< 0.3	< 0.5	< 0.5	0.90 TAME	24	< 0.5
	11/27/02	< 50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to <10	20	NA
	02/27/03	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	3.7	NA
	06/06/03	< 50	< 0.6	< 0.6	<1.0	<1.0	<1.0 to <20	1.5	NA
	09/16/03	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	1.3	NA
MW-6	12/10/03	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	3.0	NA
	03/15/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	<1.0	NA
	06/29/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	<1.0	NA
	11/12/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	NA	2.5	NA
	02/07/05	< 50	< 0.5	< 0.5	< 0.5	<1.5	NA	<2.5	NA
	05/05/05	< 50	< 0.5	< 0.5	< 0.5	<1.5	NA	<2.5	NA

Table 5: Monitoring Well Groundwater Analytical Results 6100 Sebastopol Road, Sebastopol

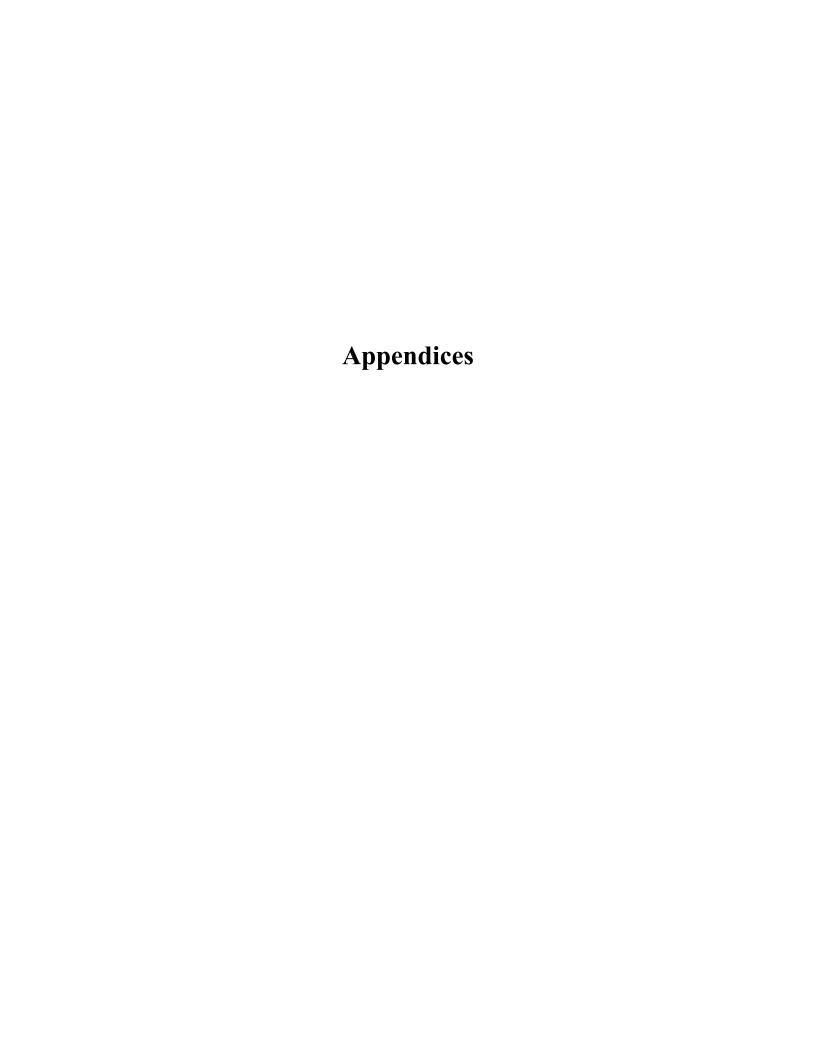
ID	Date	TPH-g	В	T	E	X	Other Oxys	MTBE	Pb Scavs
110	Date	-			μ	g/L			-
	08/19/02	< 50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to<10	52	< 0.5
	11/27/02	< 50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to <10	34	NA
	02/27/03	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	27	NA
	06/06/03	< 50	0.49	< 0.3	< 0.5	< 0.5	<0.5 to <10	17	NA
	09/16/03	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	25	NA
MW-7	12/10/03	< 50	0.59	< 0.5	< 0.5	<1.5	<1.0 to <25	14	NA
IVI VV - /	03/15/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	9.5	NA
	06/29/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	8.9	NA
	09/22/04	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	13	NA
	11/12/04	< 50	0.95	< 0.5	1.2	<1.5	NA	11	NA
	02/07/05	110	1.0	0.62	1.1	1.8	NA	8.3	NA
	05/05/05	< 50	< 0.5	< 0.5	< 0.5	<1.5	NA	4.9	NA
	08/19/02	< 50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to<10	< 0.5	< 0.5
	11/27/02	< 50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to <10	< 0.5	NA
	02/27/03	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	<1.0	NA
	06/06/03	< 50	< 0.3	< 0.3	< 0.5	< 0.5	<0.5 to <10	< 0.5	NA
	09/16/03	< 50	<1.0	<1.0	<1.0	<1.0	<1.0 to <25	<1.0	NA
MW-8	12/10/03	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	<1.0	NA
	03/15/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	<1.0	NA
	06/29/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	<1.0 to <25	<1.0	NA
	11/12/04	< 50	< 0.5	< 0.5	< 0.5	<1.5	NA	<2.5	NA
	02/07/05	<50	< 0.5	< 0.5	< 0.5	<1.5	NA	<2.5	NA
	05/05/05	< 50	< 0.5	< 0.5	< 0.5	<1.5	NA	<2.5	NA

Table 5: Monitoring Well Groundwater Analytical Results 6100 Sebastopol Road, Sebastopol

ID	D-4-	TPH-g	В	T	E	X	Other Oxys	MTBE	Pb Scavs
ID	Date				μį	g/L			
	09/16/03	24,000	530	600	1,300	3,470	<20 to <500	<20	NA
	12/10/03	25,000	800	730	1,400	3,200	<1.0 to <25	14	NA
	03/15/04	28,000	1,000	830	1,600	4,500	<2.0 to <50	8.3	NA
	06/29/04	29,000	670	620	1,300	3,200	<5.0 to <100	11	NA
MW-9	09/22/04	18,000	730	370	990	1,760	<1.0 to <25	9.9	NA
	11/12/04	17,000	850	520	940	1,900	NA	10	NA
	02/07/05	280,000**	7,300	11,000	6,700	28,000	NA	1,400	NA
	03/21/05	65,000	3,700	2,900	1,800	2,600	NA	23***	NA
	05/05/05		Not sampled due to presence of free product in well						
MW-10D	02/07/05	6,000	500	23	73	200	NA	42	NA
W - 10D	05/05/05	3,200	430	< 5.0	300	20	NA	<25	NA
MW-11	02/07/05	17,000	55	74	560	710	NA	130	NA
1V1 VV - 1 1	05/05/05	11,000	26	80	540	620	NA	<25	NA
MW-12	02/07/05	33,000	1,200	520	2,600	3,300	NA	270	NA
1V1 VV -1 Z	05/05/05	26,000	2,100	210	2,500	1,800	NA	<100	NA
MW-13	02/07/05	240	5.1	11	11	38	NA	<2.5	NA
1V1 VV -13	05/05/05	53	1.5	< 0.5	2.4	2.0	NA	< 2.5	NA

\*\* Free product.

\*\*\* ND for the additional fuel oxygenates.



## Appendix A

Unified Soil Classification System Chart and Boring Log Legend Boring Logs for MW-10D through MW-13 DWR 188 forms for MW-10D through MW-13

GENE	RAL SOIL CAT	EGORIES	-	BOLS	TYPICAL SOIL TYPES
		Clean Gravel	X	GW	Well Graded Gravels, Gravel - Sand mixtures
ω ω	Gravel  More than half of	with little or no fines		GP	Poorly Graded Gravels, Gravel - Sand mixtures
ED SOILS is larger sieve	coarse fraction is larger than No. 4 sieve size	Gravel with		GM	Silty Gravels, Poorly Graded; Gravel - Sand - Silt Mixtures
OARSE GRAINED SOIL More than half is larger than no. 200 sieve		more than 12% fines		GC	Clayey Gravels, Poorly Graded; Gravel - Sand - Clay Mixtures
ARSE GRA	Sand	Clean Sand with little or	0.00	SW	Well Graded Sands, Gravelly Sands
COARSE More th	More than half of	no fines		SP	Poorly Graded Sands, Gravelly Sands
Ö	coarse fraction is smaller than No. 4 sieve size	Sand with more than		SM	Silty Sands, Poorly Graded; Sand - Silt Mixtures
		12% fines		sc	Clayey Sands, Poorly Graded; Sand - Clay Mixtures
_	Silt and Clay			ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
SOILS s smalle sieve	Liquid Limit Less			CL	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
INED Salf is \$200 si	than 50%			OL	Organic Silts and Organic Silty Clays of Low Plasticity
GRAI nan h	Silt and Clay			МН	Inorganic Silts, Micaceous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silts
FINE Nore th	Liquid Limit Greater			СН	Inorganic Clays of High Plasticity, Fat Clays
	than 50%			ОН	Organic Clays of Medium to High Plasticity
	Highly Organic So	ils	7 77 7	PT	Peat and Other Highly Organic Soils
	Bedrock			BR	Bedrock
	Aggregate Base			В	Mixed Fill
	Asphalt		X	Α	Asphalt
	Concrete			С	Concrete
	mple submitted for cher	•	CMS SPT CBS GRA	= Stan	Modified Split Spoon dard Penetration Test   ☐ First Identified Free Water cinuous Barrel Sample  ☐ n.a. = not applicable

## SCS ENGINEERS

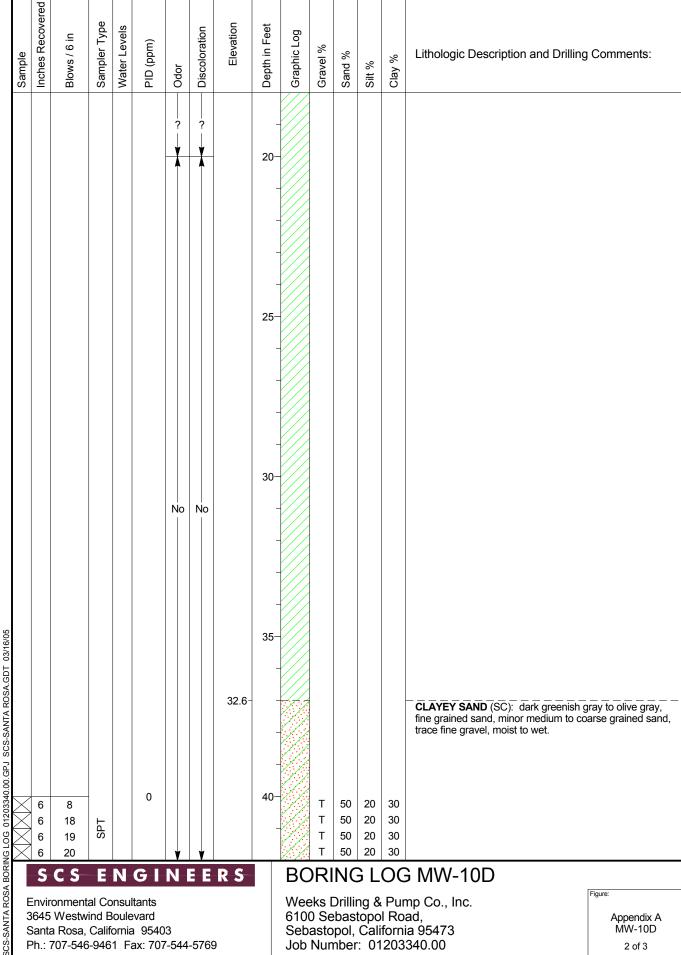
Environmental Consultants 3645 Westwind Boulevard Santa Rosa, California 95403 Ph.: 707-546-9461 Fax: 707-544-5769

# UNIFIED SOIL CLASSIFICATION SYSTEM CHART and BORING LOG LEGEND

Weeks Drilling & Pump Co., Inc. 6100 Sebastopol Road, Sebastopol, California 95473 Job Number: 01203340.00 Figure

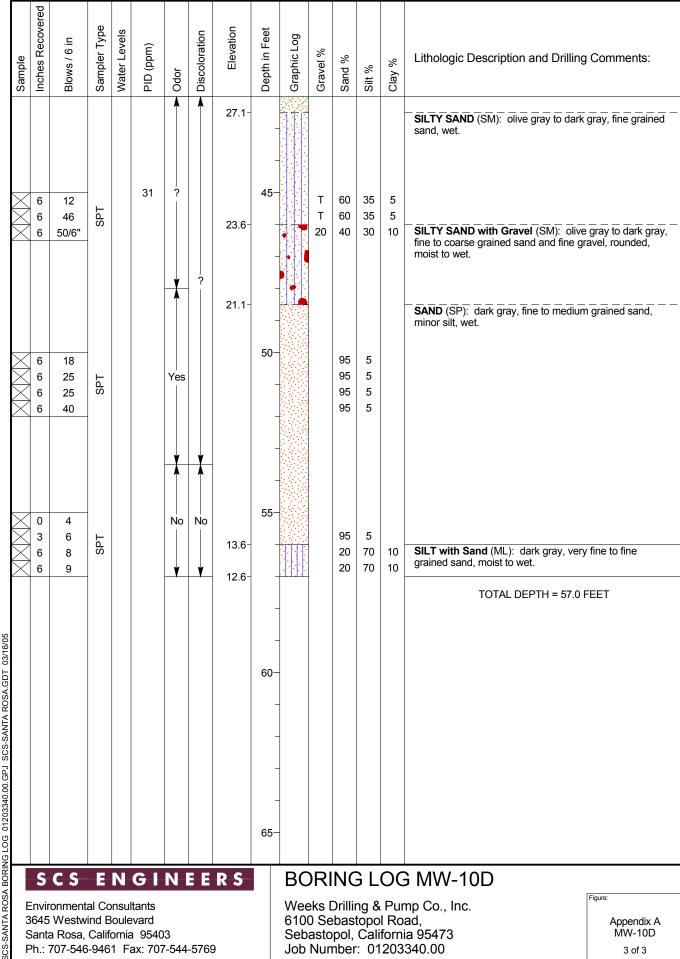
Appendix A A-1 1 of 1

Drill Log	ling Igeo	tart, en Time (s d By: ed By:	start,	enc	30 (t	3:30 -		30		Bor <b>MW</b>	ing I -10		See	e Uni	ocation: See site plan, adjacent to MW- 9 fied Soil Classification System (USCS) end and information not noted.
Drill Drill Sar Har	ler's ling npli nme	Name Methoding Met er weig	: <u>Tin</u> d: <u>14</u> hod: ht / fa	n Te -in N CM all:_	ller Mud R ISS 140 lb	otary s / 30	/8-in ) inch		-Sten		er		A	emer uger	stalled: Y⊠ N□ if no, boring backfilled with:  nt □ Bentonite: Cement □ Grout □ Chips  Depth, ft: 55.5 Total Depth, ft: 57.0
Sample	Inches Recovered	Blows / 6 in	Sampler Type	Water Levels	out sain (mdd) OIA	Odor	Discoloration	Elevation	Depth in Feet	Graphic Log	Gravel %	Sand %	Silt %	Clay %	Lithologic Description and Drilling Comments:
	=	ш		^		No V	No Y	69.6 69.1- 68.6- 65.6-	5-			03			CONCRETE: over base rock.  CLAY (CH): dark greenish gray.  Lithology between 1-45' from MW-9 and drill cutting  SILT (ML): with clay.
				፟፟፟፟፟፟		*	*	62.1-	10-						SAND with Silt (SM): gray.  CLAY (CL): brown.  Gray.
	S	C S	E	2	GΙ	?	? 	R S	15-	BC	) RI	NO	3 L	00	S MW-10D
3 S	SCS ENGINEERS  Environmental Consultants 3645 Westwind Boulevard Santa Rosa, California 95403 Ph.: 707-546-9461 Fax: 707-544-5769										0 Se asto	bas pol,	topo Cal	l Ro iforn	mp Co., Inc. ad, ia 95473 340.00  Appendix A MW-10D 1 of 3



**Environmental Consultants** 3645 Westwind Boulevard Santa Rosa, California 95403 Ph.: 707-546-9461 Fax: 707-544-5769 Weeks Drilling & Pump Co., Inc. 6100 Sebastopol Road, Sebastopol, California 95473 Job Number: 01203340.00

Appendix A MW-10D 2 of 3



3645 Westwind Boulevard Santa Rosa, California 95403 Ph.: 707-546-9461 Fax: 707-544-5769 6100 Sebastopol Road, Sebastopol, California 95473 Job Number: 01203340.00

Appendix A MW-10D 3 of 3

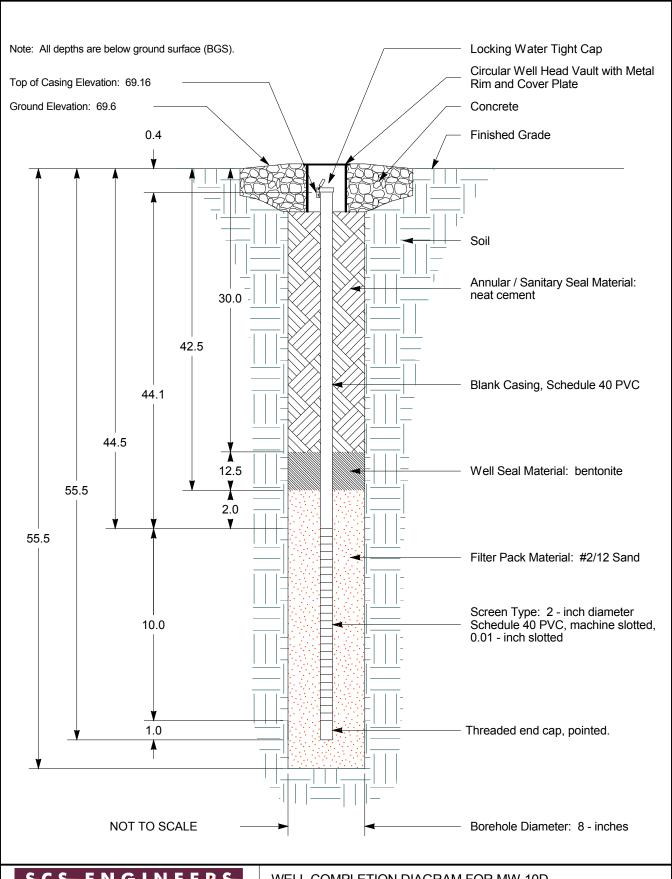
Dril	lling	tart, er Time ( l By:	start,	enc	d) 14	1:45 -		00			ing 1				ocation: See site plan.  fied Soil Classification System (USCS)
Dril Dril Dril Dril Sai Hai	ecke Iling Iler's Iling mplii	ed By: Contra Name	actor: :: <u>Tin</u> d: <u>8-i</u> :hod:	Wen Te	eeks E ller ollow- ISS	Orilling Stem	Auge	er					for M Ce	Lege W In emer	nd and information not noted.  stalled: Y⊠ N□ if no, boring backfilled with:  nt□ Bentonite: Cement □ Grout□ Chips  Depth, ft: 17.0 Total Depth, ft: 17.0
Sample	Inches Recovered	Blows / 6 in	Sampler Type	Water Levels	PID (ppm)	Odor	Discoloration	Flevation 6.69	Depth in Feet	Graphic Log	Gravel %	Sand %	Silt %	Clay %	Lithologic Description and Drilling Comments:
						No	No -	69.2- 68.2-							CONCRETE: over base rock.  CLAY (CH): dark gray.
	6 6	5 11 17	CMSS		5.0	<u> </u>	*	64.6- 63.7-	5-			10 50	60 40	30	SILT (ML): grayish brown.  SILTY SAND (SM): dark gray, very fine to fine grained sand, moist to wet.
$\times$	6	5		Ţ	1.0	Yes	?	61.2-	10-			40	50	10	SANDY SILT (ML): dark gray, very fine to fine grained sand, wet.
	6	7 9	CMSS				À	58.7-				40	50 20	10 80	CLAY (CL): dark gray, moist to wet.
						No	No					5	25	70	
	6 6	4 6 8	CMSS		0				15-			5 10 5	35 30 25	60 60 70	Minor fine to medium grained sand.
						7	,	52.7-	•						TOTAL DEPTH = 17.0 FEET
3	Envir 8645 Santa	C S onment Westwa Rosa, 707-546	tal Co /ind E Calif	onsul Boule Fornia	Itants evard a 9540	03		R S		Wee 6100 Seb	eks I O Se asto	Drilli bas pol,	ng & topo Cali	Pur I Ro iforni	Figure: Appendix A MW-11 340.00  Appendix A MW-11 1 of 1

Da	ite (s	tart, er	nd):	1/2	0/05 -	1/20	)/05			Bor	ing l	No.	Bor	ing L	ocation: See site plan.	
	٠,	Time (	,					<b>1</b> 5		M۱	<b>W</b> -'	12				
		d By:	Step	ohen	Knüt	tel									fied Soil Classification System (USCS)	
		ed By:													nd and information not noted.	
		Contra Name				Orillin	g & F	Pump Co							stalled: Y⊠ N□ if no, boring backfilled with	
						Stem	Aug	er					_		nt 🗌 Bentonite: Cement 🗍 Grout 🗍 Ch	-
Sa	mpli	ng Met	:hod:	CM	SS								A	uger	Depth, ft: <u>17.0</u> Total Depth, ft: <u>17.0</u>	
	ammo tes:	er weig	ht / f	all:_	140 lb	s / 30	) inch	1								
INC	nes.															
	ered															
	Inches Recovered	.⊑	Sampler Type	sla/			tion	ıtion	eet	go						
e e	s Re	9/8	oler 1	Water Levels	PID (ppm)		Discoloration	Elevation	Depth in Feet	Graphic Log	% <del>10</del>	%		%	Lithologic Description and Drilling Comments	:
Sample	nche	Blows / 6	Samp	Vate	) <u>Ol</u>	Odor	Oisco		Septi	Grapl	Gravel %	Sand %	Silt %	Clay		
0)	-	ш	0)			<b> </b>	<b> </b>	69.4				0)	0)		CONCRETE: over base rock.	
								68.9- 68.4-			İ					
						No	No	00.4							CLAY (CH): dark gray, moist to wet.	
							L V									
						1	1								Greenish gray.	
							Yes	64.4-	5-						SILT (ML): greenish gray, minor very fine grained sa	
															moist to wet.	ıııu,
$\times$	6	10	SS		57					-			70	30		
$\times$	6	15 15	CMSS	Ā		Yes	<b>X</b>	62.4-		13 30 5	Т	70	70 20	30	SILTY SAND (SM): dark gray to black, very fine to f	ine
	0	10									'	10	20	10	grained sand, wet.	
								60.4-		HH					SILT (ML): dark gray, minor very fine grained sand,	
					6				10-						wet.	
$\bowtie$	6	4 5	CMSS		Ū				10			10	60	30		
	6	6	S				1	58.4-			<u> </u>	10	30	70	CLAY (CL): dark gray, minor, moist to wet.	
							No				-					
										1///						
						No				1///						
$\geq$	6	6	SS		0				15-				40	60		
$\stackrel{\times}{\subset}$	6	7 11	CMSS							4///			40	60		
$\triangle$	0	11						50.4					40			
								52.4-							TOTAL DEPTH = 17.0 FEET	
	S	C S	F	NL	C T	NL	<u> </u>	R S		BC		NIC	ı 5	$\bigcap_{i \in \mathcal{I}} (A_i)$	6 MW-12	
						IV		K 3							Figure:	
		onment Westw								610	0 Se	bas	topo	l Ro	mp Co., Inc. ad, Appendio	κA
:		a Rosa,					F701	_		Seb	asto	pol,	Cal	iforn	ia 95473 MW-12	
1	۲n.: ٔ	707-546	o-946	1 F	ax: 70	7-544	-5/69	J		Job	Nur	npei	r: 0′	1203	340.00 1 of 1	

Dril Log Che Dril Dril Dril Sar	ling ged ecke ling ler's ling mplir	tart, er Time ( I By: ed By: Contra Name Metho ng Met er weig	start, Step actor: : Tin d: 8-i	went of the control o	H) 10 Knütt eeks E ller ollow-S	0:50 tel <u>Orillin</u> Stem	g & F	oump Co				13	See for M	e Uni Lege W In	ocation: See site plan.  fied Soil Classification System (USCS) and and information not noted.  stalled: Y⊠ N□ if no, boring backfilled with:  nt □ Bentonite: Cement □ Grout □ Chips□  Depth, ft: 15.0 Total Depth, ft: 15.0
Sample	Inches Recovered	Blows / 6 in	Sampler Type	Water Levels	PID (ppm)	Odor	■ Discoloration	Elevation 69.4	Depth in Feet	Graphic Log	Gravel %	Sand %	Silt %	Clay %	Lithologic Description and Drilling Comments:  ASPHALT: over base rock.
	6 6 6 6	10 17 21 4 6 6	CMSS CMSS	፟፟፟፟፟፟፟	0	No	No	67.4- 64.4- 63.4- 59.9- 59.0-	10-			50 90 90	50 10 10 20 20	80 80	CLAY (CL): dark gray, moist to wet.  Light brown, increasing silt content.  SILT (ML): brown, minor very fine to fine grained sand, moist to wet.  SAND with Silt (SP-SM): brown, fine grained sand, wet.  SANDY SILT (ML): brown, very fine to fine grained sand, moist to wet.  CLAY (CL): gray, moist.
3 S P	inviro 645 anta	C S onment Westwa Rosa, 707-546	tal Co vind E Calif	onsul Boule Fornia	tants vard 9540	03		R S		Wee 610 Seb	eks I 0 Se asto	Drilli ebas pol,	ng 8 topo Cal	Pui I Ro	Figure:  Appendix A MW-13 340.00  Appendix A MW-13 1 of 1

# **Appendix B**

Well Completion Diagrams for MW-10D through MW-13



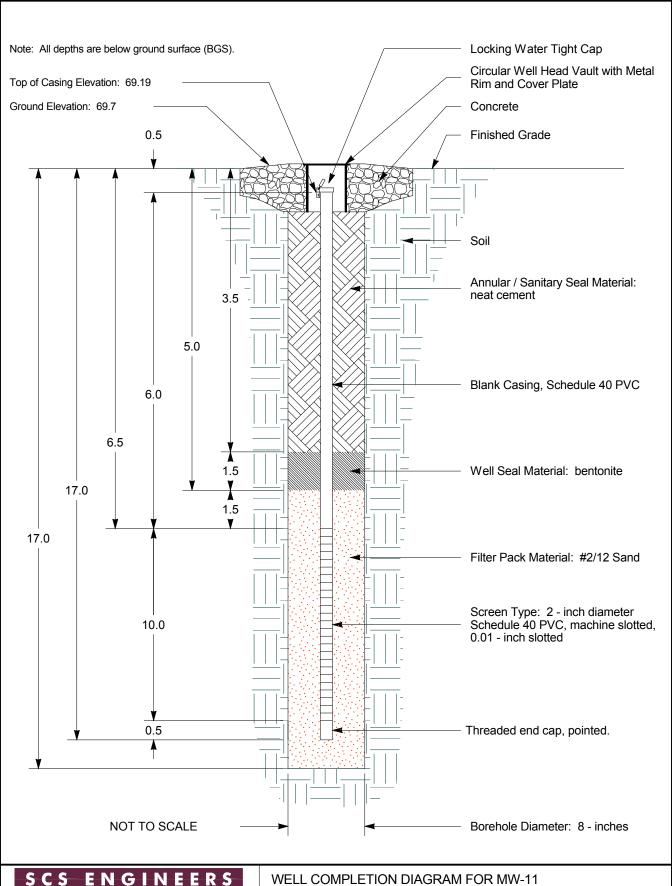
**Environmental Consultants** 3645 Westwind Boulevard Santa Rosa, California 95403

Ph.: 707-546-9461 Fax: 707-544-5769

#### WELL COMPLETION DIAGRAM FOR MW-10D

Weeks Drilling & Pump Co., Inc. 6100 Sebastopol Road, Sebastopol, California 95473 Job Number: 01203340.00

Appendix B MW-10D

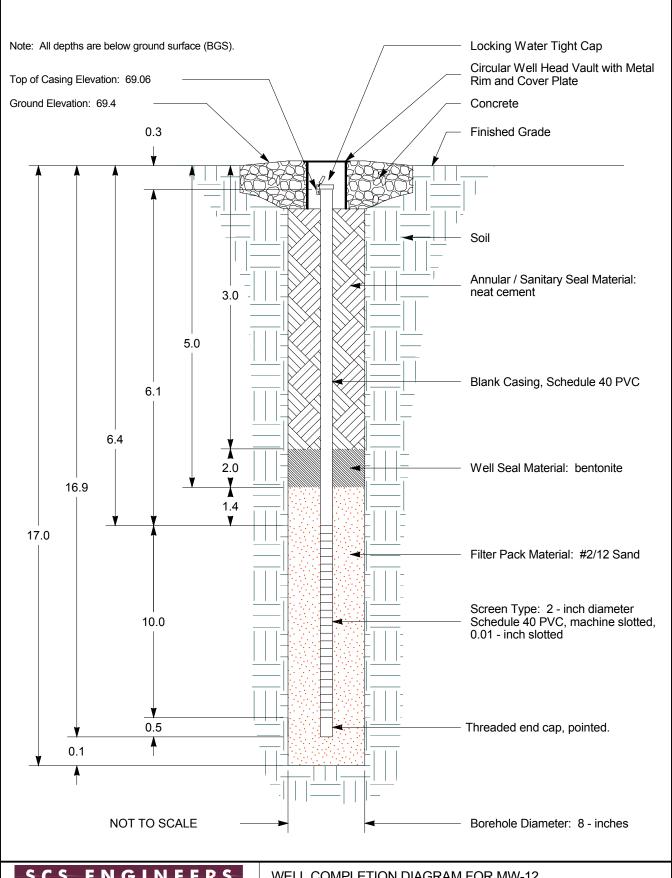


**Environmental Consultants** 3645 Westwind Boulevard Santa Rosa, California 95403 Ph.: 707-546-9461 Fax: 707-544-5769

Weeks Drilling & Pump Co., Inc. 6100 Sebastopol Road, Sebastopol, California 95473 Job Number: 01203340.00

Figure:

Appendix B MW-11



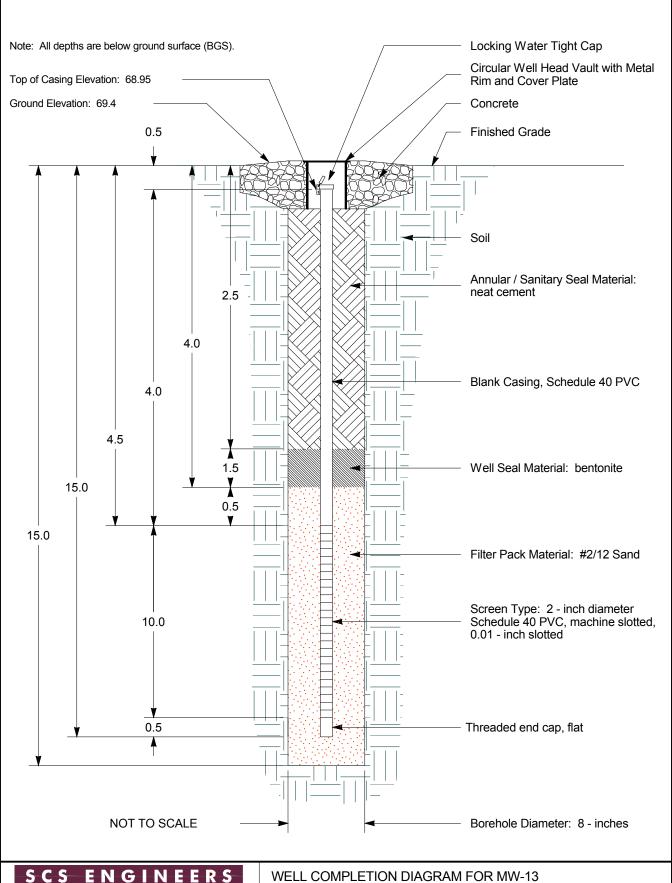
**Environmental Consultants** 3645 Westwind Boulevard Santa Rosa, California 95403 Ph.: 707-546-9461 Fax: 707-544-5769

#### WELL COMPLETION DIAGRAM FOR MW-12

Weeks Drilling & Pump Co., Inc. 6100 Sebastopol Road, Sebastopol, California 95473 Job Number: 01203340.00

Figure:

Appendix B MW-12



**Environmental Consultants** 3645 Westwind Boulevard Santa Rosa, California 95403 Ph.: 707-546-9461 Fax: 707-544-5769 Weeks Drilling & Pump Co., Inc.

6100 Sebastopol Road, Sebastopol, California 95473 Job Number: 01203340.00

Figure:

Appendix B MW-13

## **Appendix C**

Well Development Records for February 2 and March 21, 2005 Well Purge Records for February 7, March 21, and April 5, 2005

S C S E	N G	ΙN	Ε	E R	S	WELL DI	EVEL	OPMENT RECORD	WELL NUMBER  MW-11
PROJECT Wee	ks Drilli	ng & P	ump	) Co., l	nc.	JOB NUMBER 012033	40.00	6100 Sebastopol Road,	RECORDED BY  Amy Yardley
PROJECT LOCATION						AIR TEMPERATU	JRE	WEATHER	SUBCONTRACTOR
6100 Sebas	stopol Ro	ad, Se	bast	topol, (	California	~60s - ~	√70s °	Sunny	None
HAND PUMP (HP) _ SUBMERSIBLE PUMP (SP) _ BAILER (B) _ SURGE BLOCK (SB) _	METHOD	X			DEVELOPMENT CI Minimum of stabilized.  REMARKS		s or unt	il discharge is clear and water o	characteristics have
HOLE DIAMETE WELL CASING INSIDE DIAM	М	d <sub>H</sub> d <sub>W</sub> ID d <sub>W</sub> OD		2.0	d <sub>w</sub>	GROUND SUF	RFACE (E)	PURGE VOLUME CALCULATION CASING VOLUME = $V_{C} = \pi \left(\frac{d_{W}ID}{2}\right)^{2} (TD_{C} - H) =$ $= 0.26 \text{ ft}^{3}$ FILTER PACK PORE VOLUME	3.14 (-2-)² (17.0 - 4.9)
DEPTH TO: WATER LEV BASE OF SE BASE OF SC	EAL	h S TD <sub>S</sub>	= = =	4.43 5.0 16.5		TI	$D_{s}$ $TD_{c}$	$V_F = \pi \left[ \left( \frac{d_H}{2} \right)^2 - \left( \frac{d_WOD}{2} \right)^2 \right]$ = <b>0.91 ft</b> <sup>3</sup>	

BASE OF SUMP 17.0 SCREEN INTERVAL ESTIMATED FILTER PACK POROSITY 0.25 Diameters in (inches) : Depths in (feet)

TOTAL WELL VOLUME =

 $V_T = V_C + V_F = 1.17 \text{ ft}^3 \text{ x 7.48 gal/ft}^3 = 8.7 \text{ gal}$ 

( \* If S > H, use S; If S < H, use H )

	DEVE	LOPMEN	NT LOG			LATIVE EMOVED		WATER	CHARACT	ERISTICS		COMMENTS
DATE	TIN BEGIN	ME FINISH	METHOD	WATER REMOVED (GAL)	GAL	WELL VOLUMES	pН	CONDUCTIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	
02/02/05	09:40	09:41	SP	1	1	0.11	7.16	2.92	877	17.3	3.48	
02/02/05	09:41	09:43	SP	2	3	0.34	7.16	2.66	479	16.8	3.16	
02/02/05	09:43	09:46	SP	3	6	0.69	7.21	3.07	500	17.7	3.09	
02/02/05	10:13	10:22	SB	0	6	0.69	n.a.	n.a.	n.a.	n.a.	n.a.	Surged Well
02/02/05	11:04	11:09	SP	5	11	1.26	6.88	2.52	500	16.5	3.05	
02/02/05	11:09	11:15	SP	5	16	1.83	7.15	2.81	500	17.9	4.42	
02/02/05	11:15	11:18	SP	3	19	2.17	n.a.	n.a.	n.a.	n.a.	n.a.	Went dry

S C S E	NGI	N	F	F D	<b>S</b>	WELL DEV		OPMENT RECORD	WELL NUMBER
PROJECT	11 0 1		_			JOB NUMBER		SITE	MW-12  RECORDED BY
	eks Drilling	& P	ump	Co., 1	Inc.	01203340	.00	6100 Sebastopol Road,	Amy Yardley
PROJECT LOCATION		<u>'</u>				AIR TEMPERATURI	Ξ	WEATHER	SUBCONTRACTOR
6100 Seba	stopol Road	d, Sel	bast	topol, (	California	~60s - ~70	)s °	Sunny	None
HAND PUMP (HP) SUBMERSIBLE PUMP (SP) BAILER (B)		X			stabilized.  REMARKS	4 well volumes of		il discharge is clear and water o	characteristics have
SURGE BLOCK (SB)		X			_				
HOLE DIAMETE WELL CASING INSIDE DIA		н wID	=	8.0	→ d <sub>w</sub>	GROUND SURFA	CE (E)	PURGE VOLUME CALCULATION CASING VOLUME = $V_{c} = \pi \left(\frac{d_{w}ID}{2}\right)^{2} (TD_{c} - H) = 0$	
INSIDE DIAI OUTSIDE D		wID		20	-0.40 h ↓	H   S		= 0.27 ft <sup>3</sup>	( - /

 $TD_{S}$ 

 $TD_{C}$ 

DEPTH TO: WATER LEVEL 4.31 BASE OF SEAL S 5.0 BASE OF SCREEN  $\mathsf{TD}_\mathsf{S}$ 16.4 BASE OF SUMP 16.9 ESTIMATED FILTER 0.25 PACK POROSITY  $d_H$ 

Diameters in (inches) : Depths in (feet)

FILTER PACK PORE VOLUME =

 $= \pi \left[ \left( \frac{d_{H}}{2} \right)^{2} - \right]$ = 0.90 ft<sup>3</sup>  $\left(\frac{d_{\text{W}}\text{OD}}{2}\right)^{2}$  (  $\text{TD}_{\text{s}}$  - ( S or H )\* )( P )

TOTAL WELL VOLUME =

 $V_T = V_C + V_F = 1.16 \text{ ft}^3 \text{ x 7.48 gal/ft}^3 = 8.7 \text{ gal}$ 

( \* If S > H, use S; If S < H, use H )

		DEVE	LOPME	NT LOG			LATIVE REMOVED		WATER	CHARACT	ERISTICS		COMMENTS
	DATE	TII	ME FINISH	METHOD	WATER REMOVED (GAL)	GAL	WELL VOLUMES	pН	CONDUCTIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	
	02/02/05	09:54	09:56	SP	2	3	0.34	6.9	2.37	500	16.3	6.73	
	02/02/05	09:54	09:58	SP	2	5	0.54	6.9	2.57	962	16.2	2.41	
	02/02/05	10:03	10:14	SB	0	5	0.57	n.a.	n.a.	902 n.a.	n.a.	n.a.	Surged well
	02/02/05	10:03	10:14	SP	1	6	0.57	7.24	3.22	500	17.1	3.13	Surged wen
	02/02/05	10:23	10:23	SP	4	10	1.15	6.97	2.59	401	16.3	4.02	
	02/02/05	10:27	10:31	SP	5	15	1.72	6.88	2.49	512	16.1	3.75	
	02/02/05	10:31	10:36	SP	5	20	2.30	6.94	2.63	481	16.7	3.26	
	02/02/05	10:36	10:41	SP	5	25	2.87	7.04	2.78	481	17.1	4.35	
	02/02/05	10:41	10:51	SP	10	35	4.02	6.99	2.46	*MLE	16.9	6.91	
	02/02/05	10:51	11:01	SP	10	45	5.17	6.88	2.4	*MLE	16.4	7.41	
/2005	02/02/05	11:01	11:11	SP	10	55	6.32	6.89	2.41	*MLE	16.5	6.74	
Project ID: 01203340.00.GPJ Date: 3/8/2005													
PJ Da													
.00.G													
03340													
J: 012													
ject II													
2 Pro													
ENT													
LOPN													
Report Form: WELL DEVELOPMENT													
ELL I													
rm: W													
эн Fо													
Rep													

					_				WELL NUMBER
SCSE	NGI	N	E	E R	S	WELL	DEVEL	OPMENT RECORD	MW-13
PROJECT						JOB NUMBE	R	SITE	RECORDED BY
We	eks Drilling	& P	ump	Co., I	nc.	0120	3340.00	6100 Sebastopol Road,	Amy Yardley
PROJECT LOCATION						AIR TEMPER	ATURE	WEATHER	SUBCONTRACTOR
6100 Seba	astopol Road	l, Se	ebast	opol, C	California	~60s	-~70s°	Sunny	None
HAND PUMP (HP)	METHOD				DEVELOPMENT CR Minimum of stabilized.		mes or unt	il discharge is clear and water	characteristics have
SUBMERSIBLE PUMP (SP) BAILER (B)		X			REMARKS  MLE = Met	er Limit E	ceeded, i.e	e. >999 NTU's).	
SURGE BLOCK (SB)	)	X							
HOLE DIAMETE	ER d <sub>r</sub>	4	=	8.0	→ d <sub>w</sub>		SURFACE (E)	PURGE VOLUME CALCULATED CASING VOLUME =	
WELL CASING		ID	_		<b>→ → → → → → → → → →</b>		1	$V_{\rm C} = \pi \left(\frac{d_{\rm W}ID}{2}\right)^2 (TD_{\rm C} - H)$	$= 3.14 \left( \frac{1}{2} \right)^2 (15.0 - 5.1)$

 $d_H$ 

INSIDE DIAM  $d_wID$ OUTSIDE DIAM  $d_wOD =$ 2.0 DEPTH TO: WATER LEVEL 4.56  $TD_{S}$ BASE OF SEAL S = 4.0  $TD_{C}$  $\mathsf{TD}_{\mathsf{S}}$ BASE OF SCREEN 14.5 BASE OF SUMP 15.0 ESTIMATED FILTER = 0.25 PACK POROSITY

Diameters in (inches) : Depths in (feet)

 $= 0.22 \text{ ft}^3$ 

FILTER PACK PORE VOLUME =

$$V_{F} = \pi \left[ \left( \frac{d_{H}}{2} \right)^{2} - \left( \frac{d_{W}OD}{2} \right)^{2} \right] (TD_{s} - (S \text{ or H})^{*})(P)$$

$$= 0.74 \text{ ft}^{3}$$

TOTAL WELL VOLUME =

$$V_T = V_C + V_F = 0.96 \text{ ft}^3 \text{ x 7.48 gal/ft}^3 = 7.2 \text{ gal}$$

( \* If S > H, use S; If S < H, use H )

	DEVE	LOPMEN	NT LOG			LATIVE REMOVED		WATER	CHARACT	ERISTICS		COMMENTS
DATE	TIM BEGIN	FINISH	- METHOD	WATER REMOVED (GAL)	GAL	WELL VOLUMES	pН	CONDUCTIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	
02/02/05	10:15	10:16	SP	1	1	0.14	7.22	4.55	*MLE	17.1	2.07	
02/02/05	10:16	10:18	SP	2	3	0.42	7.11	4.48	*MLE	18.1	3.11	
02/02/05	10:18	10:20	SP	2	5	0.70	7.13	4.7	893	18.6	3.13	
02/02/05	10:25	10:33	SB	0	5	0.70	n.a.	n.a.	n.a.	n.a.	n.a.	Surged well
02/02/05	11:20	11:25	SP	5	10	1.39	6.95	3.85	563	17.5	4.7	
02/02/05	11:25	11:30	SP	5	15	2.09	7.02	3.98	479	18.5	3.71	
02/02/05	11:30	11:40	SP	10	25	3.48	6.89	3.74	*MLE	18.3	8.71	
02/02/05	11:40	11:50	SP	10	35	4.87	6.8	3.7	461	18	8.64	
02/02/05	11:50	12:00	SP	10	45	6.27	6.75	3.69	793	18.1	8.08	
02/02/05	12:00	12:07	SP	7	52	7.24	6.75	3.68	295	18	8.31	
02/02/05	12:07	12:10	SP	3	55	7.66	6.72	3.69	205	18.1	8.37	

	S E N	1 G I 1	NEEF	R S		20	PURGE 005 - 1st Qu	ıarter	RD		WELL NUMBER  MW- 1
PROJECT	XX/ l	. D.::112 (	2 D C	. T		JOB NUMBE	R 3 <b>340.00</b>	SITE	\-l41		RECORDED BY
	weeks		& Pump C						Sebastopol		Amy Yardley
HAND PUI		<i>MET</i>	GING HOD	SAMPLIN METHOL		for 2" dia	n. wells), unt or until dry.	til water pa	rameters (	pH, temp.,	es (or 5 gallons minimun cond.) have stabilized
BAILER OTHER	SIBLE PUMP		<u>x</u>	X		* Oil/wat Exceeded	er interface l, i.e. >999 N	probe used TU's).	to check f	for NAPLs;	MLE = Meter Limit
CASING	DIAMETER	(D <sub>c</sub> ): 2.0	)			DATE OF	SAMPLING:			:	2/7/2005
DEPTH 1	ГО:		Т	$\rightarrow$ D <sub>C</sub>	GROUND SURFACE (FM)	WEATHE	:R:				Sunny
WATE	R (h):	4.3	2 <del>V</del>	<u> </u>	SURFACE		WATER LEV	ELS FROM	TOC:	4	.33 / 4.32
NAPL:		n.a	·* -0.50	h		TAGGED	WELL DEPT	H FROM TO	C:		14.16
NAPL TH	ICKNESS:	n.a	.*	h H	H	PURGE V	OLUME (3 C	ASING VOLU	JMES):	4.	5 gallons
SCREEN	DEPTH:					DEPTH T	O WATER FO	OR 80% REC	HARGE:	6.16	ft. below TOC
TOP:		4.0	)	<b>↓</b>   <b>▼</b>	$TD_{c}$	TIME OF	SAMPLING:				10:45
BOTTO	OM:	14.	0	<b>-</b>	:	DEPTH T	O WATER A	T TIME OF S	AMPLING:	4.40	ft. below TOC
TOTAL D	EPTH (TD <sub>0</sub>	c): <u>14.0</u>	00		SCREEN INTERVAL	APPEARA	ANCE OF SAI	MPLE:			Clear
Diameters i	n (inches) : De	epths in (feet)				LABORA				Analy	tical Sciences
	NG VOLUME 3.14 (D <sub>c</sub> / 2) <sup>2</sup> ]		1.50 gallo	ns			IN OF CUST	ODY FORM I	OR ANALY		
	PURGIN	IG DATA			JLATIVE REMOVED		WATER	CHARACTE	RISTICS		COMMENTS
DATE	TII	ME FINISH	WATER REMOVED (GAL)	GAL	CASING VOLUMES	pН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	
2/7/05	10:00	10:01	1	1	0.67	7.39	1.500	*MLE	16.8	0.48	
2/7/05	10:00	10:01	2	3	2.00	7.39	1.410	515	16.5	0.48	
2/7/05	10:01	10:05	2	5	3.34	7.26	1.290	232	16.8	0.36	
2///03	10.03	10.03	2	- 3	3.34	7.20	1,290	232	10.0	0.50	
				<b>1</b>							
						1					
	1				+						
					+						
					1	<u> </u>					<u> </u>

S C	S E N	I G I N	I E E F	R S			PURGE 005 - 1st Qu	WELL NUMBER  MW- 2				
PROJECT C. I.						JOB NUMBER SITE 01202340 00 6100 Sebestanel I					RECORDED BY	
	Weeks Drilling & Pump Co., Inc.						01203340.00 6100 Sebastopol Roa				Amy Yardley	
METHOD METHOD  HAND PUMP SUBMERSIBLE PUMP X						PURGING CRITERIA Minimum of 3 wetted casing volumes (or 5 gallons minimum for 2" dia. wells), until water parameters (pH, temp., cond.) have stabilized (±10%), or until dry.  REMARKS  * Oil/water interface probe used to check for NAPLs; MLE = Meter Limit Exceeded, i.e. >999 NTU's).						
OTHER												
CASING DIAMETER (D <sub>c</sub> ): 2.0 → D <sub>c</sub> ←							SAMPLING:		2/7/2005			
DEPTH T		4.2	· •		GROUND (FM) SURFACE	WEATHE	:R:				Sunny	
WATER	₹ (11).			<b>▼</b> 🖺		TAGGED	TAGGED WATER LEVELS FROM TOC: 4.21 / 4.23					
NAPL:		n.a.	-0.60	h		TAGGED	WELL DEPT	H FROM TO	C:		12.1	
	ICKNESS:	n.a.	.*	h	H	PURGE V	OLUME (3 C	ASING VOLU	JMES):	3.	.5 gallons	
SCREEN TOP:	DEPTH:	4.0	,		$TD_{c}$	DEPTH T	O WATER FO	OR 80% REC	CHARGE:	5.66	ft. below TOC	
		4.0		<u> </u>		TIME OF	SAMPLING:				11:15	
ВОТТС		12.				DEPTH T	O WATER A	T TIME OF S	AMPLING:	4.65	ft. below TOC	
	EPTH (TD <sub>c</sub>		00	<u></u>	SCREEN INTERVAL	APPEARA	ANCE OF SAI	MPLE:			Clear	
Diameters in	(inches) : De	epths in (feet)		<u> </u>	:  <b> </b>	LABORA <sup>-</sup>	TORY:			Analy	rtical Sciences	
	NG VOLUME .14 (D <sub>C</sub> / 2) <sup>2</sup> ]		1.17 gallor	ns_		SEE CHAIN OF CUSTODY FORM FOR ANALYTICAL INFO						
					JLATIVE REMOVED	WATER CHARACTERISTICS					COMMENTS	
DATE	TIM	ME	WATER REMOVED	GAL	CASING VOLUMES	рН	CONDUC- TIVITY	TURBIDITY (NTU)	TEMPER- ATURE	DISSOLVED OXYGEN		
	BEGIN	FINISH	(GAL)		702020		(mmhos/cm)	(11.0)	(°C)	(ppm)		
2/7/05	10:35	10:36	1	1	0.85	7.34	1.110	10	16.2	0.24		
2/7/05	10:36	10:38	2	3	2.56	7.24	0.890	10	16.2	0.71		
2/7/05	10:38	10:40	2	5	4.27	7.18	0.866	10	16.5	0.25		
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	SEN	1 G I 1	NEEF	? S		20	PURGE 005 - 1st Qu	ıarter	RD		WELL NUMBER MW- 3		
PROJECT	Weeks	Drilling &	& Pump C	o., Inc.		JOB NUMBER			Sebastopol		RECORDED BY  Amy Yardley		
SUBMER BAILER						PURGING CRITERIA Minimum of 3 wetted casing volumes (or 5 gallons minimum for 2" dia. wells), until water parameters (pH, temp., cond.) have stabilized (±10%), or until dry.  REMARKS  * Oil/water interface probe used to check for NAPLs; MLE = Meter Limit Exceeded, i.e. >999 NTU's).							
CASING	B DIAMETER	(D <sub>c</sub> ): 2.0	 )			DATE OF SAMPLING:					2/7/2005		
DEPTH	DEPTH TO:  WATER (b):  4 17  GROUND SURFACE  SURFACE						R: WATER LEV	4	Sunny 4.18 / 4.17				
NAPL NAPL TI	: HICKNESS:	n.a n.a	-0.69	h	H	TAGGED WELL DEPTH FROM TOC:				3.	12.26 .5 gallons		
TOP:		4.0			$\begin{array}{c c} & & \\ & & \\ & & \\ & & \end{array}$		O WATER FO	OR 80% RE0	CHARGE:	5.60 f	t. below TOC 15:00		
	DEPTH (TD <sub>o</sub>				SCREEN INTERVAL	DEPTH TO WATER AT TIME OF SAMPLING: 4.29  APPEARANCE OF SAMPLE:				ft. below TOC  Clear			
ONE CAS	Diameters in (inches): Depths in (feet)  ONE CASING VOLUME: [TD <sub>c</sub> - H] [3.14 (D <sub>c</sub> / 2)²] [7.48 gal/ft³]: 1.17 gallons				s_	LABORATORY:  SEE CHAIN OF CUSTODY FORM FOR ANA				Analytical Sciences  LYTICAL INFORMATION.			
	PURGING DATA				JLATIVE REMOVED	WATER CHARACTERISTIC:					COMMENTS		
DATE	BEGIN	FINISH	WATER REMOVED (GAL)	GAL	CASING VOLUMES	pН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)			
2/7/05	10:53	10:54	1	1	0.86	7.27	0.902	233	15.9	1.13			
2/7/05	10:54	10:56	2	3	2.57	7.21	0.820	10	16.2	0.31			
2/7/05	10:56	10:59	1	4	3.43	n.a.	n.a.	n.a.	n.a.	n.a.	Well went dry		
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		S E N	1 G I 1	NEEI	R S		20	PURGE 005 - 1st Qu	WELL NUMBER  MW- 4D				
	PROJECT Weeks Drilling & Pump Co., Inc.							340.00	6100 Sebastopol Road,			RECORDED BY  Amy Yardley	
_	PURGING METHOD  HAND PUMP SUBMERSIBLE PUMP BAILER X				SAMPLIN METHOL		PURGING CRITERIA Minimum of 3 wetted casing volumes (or 5 gallons minimu for 2" dia. wells), until water parameters (pH, temp., cond.) have stabilized (±10%), or until dry.  REMARKS  * Oil/water interface probe used to check for NAPLs; MLE = Meter Limit Exceeded, i.e. >999 NTU's).						
	OTHER						Zirectura	,					
	CASING DIAMETER (D <sub>c</sub> ): 2.0  DEPTH TO:  DC GROUN					GROUND (FM)		SAMPLING: R:			2/7/2005  Partly Cloudy		
	WATER	R (h):	47.8	80 *	<u> </u>	SURFACE (F.W.)		WATER LEV	ELS FROM	TOC:	47.5 / 47.8		
	NAPL:		n.a	·.* -0.60	h		TAGGED	WELL DEPT	H FROM TO	C:		50.3	
	NAPL TH	ICKNESS:	n.a	.*	h	H	PURGE V	OLUME (3 C	ASING VOLU	JMES):	0.	8 gallons	
	SCREEN	DEPTH:	40	0			DEPTH T	O WATER F	OR 80% REC	HARGE:	48.12	ft. below TOC	
	TOP: BOTTO	NA:			<u> </u>	$TD_{c}$	TIME OF	SAMPLING:				15:10	
		EPTH (TD <sub>o</sub>	-		_   -		DEPTH T	O WATER A	T TIME OF S	AMPLIN <u>G:</u>	47.93	ft. below TOC	
		(inches) : De				SCREEN INTERVAL	APPEARA	ANCE OF SAI	MPLE:		Slig	lightly cloudy	
		, ,	. , ,				LABORAT	TORY:			Analy	tical Sciences	
L	ONE CASING VOLUME: $[TD_c - H] [3.14 (D_c / 2)^2] [7.48 \text{ gal/ft}^3]$ : 0.26 gallons				ns	<u>s</u>		IN OF CUST	ODY FORM I	TICAL INFORMATION.			
	PURGING DATA				CUMULATIVE TOTAL REMOVED		WATER CHARACTERISTIC					COMMENTS	
	DATE	BEGIN	FINISH	WATER REMOVED (GAL)	GAL	CASING VOLUMES	pН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)		
ľ	2/7/05	09:50	10:15	0.75	0.75	2.87	7.87	0.700	*MLE	18.2	0.52	Hand Bailed	
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	SEN	G   I	NEEF	R S		20	PURGE 005 - 1st Qu	arter	RD		WELL NUMBER MW- 5			
PROJECT	Weeks	Drilling &	& Pump C	o., Inc.		JOB NUMBER			Sebastopol	recorded by pol Road, Amy Yard				
SUBMERS BAILER	PURGING S. METHOD S. METHOD X  HAND PUMP SUBMERSIBLE PUMP X BAILER OTHER					PURGING CRITERIA Minimum of 3 wetted casing volumes (or 5 gallons minimum for 2" dia. wells), until water parameters (pH, temp., cond.) have stabilized (±10%), or until dry.  REMARKS  * Oil/water interface probe used to check for NAPLs; MLE = Meter Limit Exceeded, i.e. >999 NTU's).								
CASING DEPTH WATE NAPL: NAPL TH SCREEN TOP: BOTTO	CASING DIAMETER (Dc): 2.0  DEPTH TO:  WATER (h): 4.14  NAPL: n.a.*  NAPL THICKNESS: n.a.*  SCREEN DEPTH:  TOP: 5.0  BOTTOM: 15.0  TOTAL DEPTH (TDc): 15.50							DATE OF SAMPLING:  WEATHER:  Sunny  TAGGED WATER LEVELS FROM TOC:  15.24  PURGE VOLUME (3 CASING VOLUMES):  DEPTH TO WATER FOR 80% RECHARGE:  TIME OF SAMPLING:  DEPTH TO WATER AT TIME OF SAMPLING:  APPEARANCE OF SAMPLE:  Clear						
ONE CAS	Diameters in (inches) : Depths in (feet)  ONE CASING VOLUME: $[TD_c - H][3.14 (D_c/2)^2][7.48 \text{ gal/ft}^2]$ : 1.76 gallons						LABORATORY: SEE CHAIN OF CUSTODY FORM FOR ANA				Analytical Sciences			
	PURGING DATA  CUMULATIVE TOTAL REMOVED					SLL OHA		CHARACTE	-					
DATE	TIN	ME FINISH	WATER REMOVED (GAL)	GAL	CASING VOLUMES	pН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)				
2/7/05	11:31	11:32	1	1	0.57	6.89	1.470	746	15.5	0.55				
2/7/05	11:32	11:34	2	3	1.70	6.81	1.470	147	15.1	0.93				
Report Form: WELL PURGE RECORD 2 Project ID: 01203340.00.GPJ Date: 3/8/2005														
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		S E N	G   I	NEEF	RS		20	PURGE 005 - 1st Qu	arter	RD		WELL NUMBER  MW- 6
	PROJECT	Weeks	Drilling &	& Pump C	o., Inc.		JOB NUMBER 01203	R 340.00	SITE 6100 S	Sebastopol		RECORDED BY  Amy Yardley
-	BAILER	ИР IBLE PUMP		GING 'HOD	SAMPLIN METHOL		(±10%), o	. wells), unt or until dry.	til water pa	rameters ()	pH, temp., o	s (or 5 gallons m inimum cond.) have stabilized  MLE = Meter Limit
		DIAMETER	(D <sub>c</sub> ):2.0	<u> </u>	<b>→</b> D <sub>c</sub>	<u> </u>		SAMPLING:				2/7/2005
	DEPTH T WATEI NAPL:		3.9 n.a		h	GROUND SURFACE	TAGGED	R: WATER LEV WELL DEPT			3	91 / 3.91 15.62
	NAPL TH SCREEN TOP:	ICKNESS: DEPTH:	n.a 5.0		1	H TD <sub>c</sub>	DEPTH T	OLUME (3 C. O WATER FO SAMPLING:		· —		3 gallons ft. below TOC 14:25
	TOTAL D				¥   ¥ 	SCREEN INTERVAL	DEPTH T	O WATER A		AMPLIN <u>G:</u>		ft. below TOC Clear
		NE CASING VOLUME: D <sub>c</sub> - H] [3.14 (D <sub>c</sub> / 2) <sup>2</sup> ] [7.48 gal/ft <sup>2</sup> ]: 1.76 galle PURGING DATA		1.76 gallo	ns		SEE CHA	IORY: IN OF CUSTO	ODY FORM I	OR ANALY	,	tical Sciences RMATION.
		PURGIN	G DATA			JLATIVE REMOVED		WATER	CHARACTE	RISTICS		COMMENTS
	DATE	BEGIN	FINISH	WATER REMOVED (GAL)	GAL	CASING VOLUMES	рН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	
	2/7/05	11:10	11:11	1	1	0.57	7.25	0.706	39	15.4	0.74	
	2/7/05	11:11	11:13	2	3	1.71	7.09	0.749	10	14.9	0.65	
ŀ	2/7/05	11:13	11:17	3	6	3.41	7.07	0.698	10	15.2	0.68	
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	S E N	I G I I	NEEF	RS		20	PURGE 005 - 1st Qu	ıarter	RD		WELL NUMBER  MW-7
PROJECT	Weeks	Drilling &	& Pump C	o., Inc.		JOB NUMBER 01203	340.00	SITE 6100 S	Sebastopol		RECORDED BY  Amy Yardley
BAILER	MP SIBLE PUMP		GING THOD	SAMPLING METHOD		for 2" dia (±10%), o REMARKS * Oil/wate	. wells), unt or until dry.	til water pa	rameters ()	pH, temp.,	es (or 5 gallons minimum cond.) have stabilized  MLE = Meter Limit
DEPTH 1 WATE NAPL: NAPL TH SCREEN TOP: BOTTO TOTAL D Diameters i	R (h):  IICKNESS: I DEPTH:  DM:  DEPTH (TDo n (inches): Do	4.6 n.a n.a 5.0 15. 15.0 20pths in (feet)	22 * -0.24 .* 00	▼	GROUND (FM) SURFACE (FM) H TD <sub>C</sub>	WEATHE TAGGED TAGGED PURGE V DEPTH TO TIME OF SEPTEMENT O	WATER LEV WELL DEPT OLUME (3 C. O WATER FO SAMPLING: O WATER A'	TH FROM TO ASING VOLU OR 80% REC T TIME OF S MPLE:	C: JMES): CHARGE: AMPLING:	4.94 Analy	2/7/2005 Sunny .62 / 4.62 15.5 0 gallons ft. below TOC 14:10 ft. below TOC Clear tical Sciences
	PURGING DATA TO				LATIVE REMOVED		WATER	CHARACTE	ERISTICS		COMMENTS
DATE	DATE TIME WATER REMOVED (GAL)	GAL	CASING VOLUMES	pН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)			
2/7/05	12:00	12:01	1	1	0.60	7.13	1.600	713	16.4	0.30	
2/7/05	12:01	12:03	2	3	1.81	7.07	1.620	10	16.0	0.35	
2/7/05	12:03	12:06	3	6	3.63	7.08	1.640	10	16.0	0.43	
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		S E N	I G I I	NEEF	R S		20	PURGE 005 - 1st Qu	arter	RD		WELL NUMBER  MW- 8
	PROJECT	Weeks	Drilling &	& Pump C	o., Inc.		JOB NUMBE. 01203	340.00	SITE 6100 S	Sebastopol		RECORDED BY  Amy Yardley
=	HAND PUN SUBMERS BAILER OTHER	/IP IBLE PUMP	MET	GING CHOD	SAMPLING METHOD		(±10%), ( REMARKS * Oil/wat	. wells), unt or until dry.	til water pa	rameters (	pH, temp., c	s (or 5 gallons m inimur cond.) have stabilized MLE = Meter Limit
	CASING I DEPTH T WATER NAPL: NAPL TH SCREEN TOP: BOTTO TOTAL D Diameters in	R (h):  ICKNESS:  DEPTH:  DM:  EPTH (TDc  n (inches): De	5.5 n.a n.a 5.0 15.0 15.0 epths in (feet)	4 * -0.25		GROUND (FM. SURFACE (FM. SURFAC	WEATHE TAGGED TAGGED PURGE V DEPTH T TIME OF DEPTH T APPEARA LABORA	WATER LEV WELL DEPT OLUME (3 C O WATER FO SAMPLING: O WATER A NICE OF SAI	TH FROM TO ASING VOLU OR 80% REC T TIME OF S MPLE:	C:	5 4. 7.38 f 6.25 f	2/7/2005 Sunny .52 / 5.54 .15.49 5 gallons t. below TOC .11:00 t. below TOC Clear tical Sciences RMATION.
-	DATE	PURGIN TIM BEGIN	G DATA ME FINISH	WATER REMOVED (GAL)		CASING VOLUMES	рН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	COMMENTS
ŀ	2/7/05	10:15	10:16	1	1	0.67	7.13	3.000	*MLE	15.8	0.45	
ŀ	2/7/05	10:16	10:19	2	3	2.00	7.08	3.010	211	15.3	0.37	
Report Form: WELL PURGE RECORD 2 Project ID: 01203340.00.GPJ Date: 3/8/2005	2/7/05	10:19	10:21		5	3.33	7.03	3.050		15.4	0.36	
Report Form: WELL i												

S	S C :	S E N	1 G I 1	NEEF	RS			PURGE 005 - 1st Qu		RD		WELL NUMBER  MW- 9
PROJ	JECT	Weeks	Drilling &	& Pump C	o., Inc.		JOB NUMBER		SITE	Sebastopol		RECORDED BY  Amy Yardley
	ND PUN	1P	PUR	GING CHOD	SAMPLIN METHOL		PURGING CR	RITERIA <b>Mi</b>	inimum of 3 til water pa	wetted cas	ing volume	s (or 5 gallons m inimum cond.) have stabilized
BAI	BMERS ILER HER	IBLE PUMP		<u>X</u>	X		Exceeded	er interface , i.e. >999 N uct in purge	TU's). Tec	l to check f hnician no	for NAPLs; ted strong l	MLE = Meter Limit nydrocarbon odor and
CA	ASING I	DIAMETER	(D <sub>C</sub> ):2.0	)	<b>-</b>   D	_	DATE OF	SAMPLING:			2	2/7/2005
	PTH T				$\rightarrow$ $D_{C}$	GROUND SURFACE (FM)	WEATHE	R:				Sunny
	WATER	₹ (h):	4.5		<b>▼</b>			WATER LEV	ELS FROM	TOC:	4	.55 / 4.56
	NAPL:	CKNESS:	n.a n.a	-0.21	h			WELL DEPT				15.1
		DEPTH:		<u>.                                      </u>	h	Н		OLUME (3 C.		· —		0 gallons
	TOP:	<i>DEI</i> 1111.	3.0	)		$TD_{c}$		O WATER FO	OR 80% REC	CHARGE:	6.61 f	ft. below TOC
E	воттс	M:	15.	0	<u>▼</u>   ₹	.  _▼		SAMPLING:	T TIME OF O		4.00.4	14:15
то	TAL D	EPTH (TD <sub>c</sub>	c):15.0	00		SCREEN		O WATER AT ANCE OF SAI		AMPLING:	4.661	ft. below TOC  Clear
Dia	meters in	(inches) : De	epths in (feet)		==	INTERVAL	LABORAT		VIPLE.		Analy	tical Sciences
	E CASING VOLUME: D <sub>c</sub> - H] [3.14 (D <sub>c</sub> / 2) <sup>2</sup> ] [7.48 gal/ft <sup>2</sup> ]: 1.67 gallo PURGING DATA		ns			IN OF CUST	ODY FORM I	OR ANALY				
		PURGIN	IG DATA			JLATIVE REMOVED		WATER	CHARACTE	RISTICS		COMMENTS
DA	ATE -	TII BEGIN	FINISH	WATER REMOVED (GAL)	GAL	CASING VOLUMES	рН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	
2/7	7/05	12:17	12:18	1	1	0.60	7.05	1.600	193	15.9	0.95	
2/7	7/05	12:18	12:20	2	3	1.80	6.98	1.590	10	15.5	0.75	
2/	7/05	12:20	12:23	2	5	3.00	6.94	1.550	10	15.6	0.62	
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S C S	SEN	1 G I 1	NEEF	R S			PURGE 005 - 1st Qu		RD		WELL NUMBER MW-10D RECORDED BY
ROSECI	Weeks	Drilling &	& Pump C	o., Inc.			340.00		ebastopol		Amy Yardley
HAND PUN SUBMERS BAILER OTHER		PUR MET	GING THOD	SAMPLIN METHOL	) 	for 2" dia (±10%), o REMARKS * Oil/wate	ı. wells), unt or until dry.	inimum of 3 til water pa	wetted cas rameters (	sing volume pH, temp., o	es (or 5 gallons minimum cond.) have stabilized  MLE = Meter Limit
	DIAMETER	(D <sub>c</sub> ):2.0	)	- ID		DATE OF	SAMPLING:			:	2/7/2005
DEPTH T	ГО:		1	$\rightarrow$ $D_{C}$	GROUND (E)	WEATHE	R:				Sunny
WATE	R (h):	46.7	70	<u>一</u> 問	SURFACE	TAGGED	WATER LEV	/ELS FROM	TOC:	4	6.7 / 46.7
NAPL:		n.a	* -0.50	h		TAGGED	WELL DEPT	H FROM TO	 C:		52.3
NAPL TH	ICKNESS:	n.a	.*	] }	H		OLUME (3 C			4	.1 gallons
SCREEN	DEPTH:			h 	H		O WATER FO				ft. below TOC
TOP:		44.	5		TDc			OR 60% REC	HARGE.	40.30	
вотто	OM:	54.	5 -	<u>▼   ] ▼</u>	<u>:  ₩</u>		SAMPLING:				15:55
TOTAL D	EPTH (TD <sub>c</sub>	55.5	50	==	SCREEN	DEPTH T	O WATER A	T TIME OF S	AMPLIN <u>G:</u>	46.90	ft. below TOC
	n (inches) : De			1	INTERVAL	APPEARA	ANCE OF SAI	MPLE:			Opaque
	NG VOLUME				<u> </u>	LABORAT	TORY:			Analy	tical Sciences
	TD <sub>c</sub> - H] [3.14 (D <sub>c</sub> / 2) <sup>2</sup> ] [7.48 gal/ft <sup>3</sup> ]: 1.35 gallons  PURGING DATA					SEE CHA	IN OF CUST	ODY FORM F	OR ANALY	TICAL INFOR	RMATION.
	TIME WATER		JLATIVE REMOVED		WATER	CHARACTE	RISTICS		COMMENTS		
DATE	BEGIN	ME FINISH	WATER REMOVED (GAL)	GAL	CASING VOLUMES	рН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	
2/7/05	13:13	13:54	2	2	1.48	8.26	1.830	*MLE	17,2	1.17	Hand Bailed, Well went dry

MARCH   MARC	s c	CS EN	1 G I 1	NEEF	RS			PURGE 005 - 1st Qu		RD		WELL NUMBER  MW-11
PURCING   METHOD	PROJECT		Drilling &	& Pumn C	o., Inc.		JOB NUMBER	R	SITE	Sebastonol		
DATE OF SAMPLING:   2.07/2005   2.0   DEPTH TO:   WATER (h):   4.47   4.47   4.47     4.47   4.47   4.47     4.47   4.47	SUBME	PUMP ERSIBLE PUMP	PUR MET	GING THOD	SAMPLIN METHOL		PURGING CF for 2" dia (±10%), o REMARKS * Oil/wate	RITERIA Min. wells), untor until dry.	inimum of 3 til water pa	wetted cas rameters ()	sing volume pH, temp., o	es (or 5 gallons m inimum cond.) have stabilized  MLE = Meter Limit
DEPTH TO:   WATER (In):   4.47							Exceeded	, i.e. >999 N	TU's). Tec	hnician no	ted strong l	hydrocarbon odor.
NAPL:	DEPTI	Н ТО:					WEATHE	R:		_		Sunny
DEPTH TO WATER FOR 80% RECHARGE: 6.88 ft. below TOC TIME OF SAMPLING: 14:20		. ,		*							4	
DEPTH TO WATER FOR 80% RECHARGE: 6.88 ft. below TOC TIME OF SAMPLING: 14:20	NAPL	THICKNESS:	n.a			H					5.	
BOTTOM:			0.1	-			DEPTH T	O WATER F	OR 80% REC	CHARGE:	6.88	ft. below TOC
DEPTH (TDc): 17.00   Diameters in (inches): Depths in (feet)   Depth			-		<u> </u>		TIME OF	SAMPLING:				14:20
Diameters in (inches) : Depths in (feet)   Diameters in (feet)   D			-			000554	DEPTH T	O WATER A	T TIME OF S	AMPLING:	4.53	ft. below TOC
ONE CASING VOLUME: [TD <sub>C</sub> - H] [3.14 (D <sub>C</sub> / 2/²] [7.48 gal/f²]: 1.96 gallons  PURGING DATA  TIME  DATE  TIME  BEGIN  FINISH  1.96 gallons  CASING VOLUMES  PH  CONDUCT TURBIDITY (NTU)  (mmhos/cm)  TURBIDITY (NTU)  TURBIDITY (NT									MPLE:			
PURGING DATA				1.06 gallo								
TIME	[ID <sub>C</sub> - H			1.90 galloi		II ATIVE	SEE CHA			-	TICAL INFO	•
DATE   REMOVED   GAL   CASING VOLUMES   PH   TURTY (MTU)   TURBIDITY (NTU)   ATURE OXYGEN (PPM)   TURTY (MTU)   TURBIDITY (NTU)   OXYGEN (PPM)   OXYGEN (P		PURGIN	IG DATA					WATER	CHARACTE	RISTICS		COMMENTS
2/7/05     13:01     13:03     2     3     1.53     7.12     1.780     *MLE     16.3     0.93       2/7/05     13:03     13:05     3     6     3.06     7.05     1.810     *MLE     16.1     1.17	DATE			REMOVED	GAL	CASING VOLUMES	рН	TIVITY		ATURE	OXYGEN	
2/7/05 13:03 13:05 3 6 3.06 7.05 1.810 *MLE 16.1 1.17	2/7/05	13:00	13:01	1	1	0.51	7.24	1.790	*MLE	16.8	0.55	
	-					-						
Project Form: WELL PURCE KECORD 2 Project DD 012033400016F D Date 38:2005	2/7/05	13:03	13:05	3	6	3.06	7.05	1.810	*MLE	16.1	1.17	
Popul Form, WELL PURKER RECORD 2. Project ID. 01.2033-40.00.CEP ID												
Post from: WELL PURKE RECORD 2 Project ID: 0120341000.GPJ Date: 38/2005												
Post form. WELL PURKUE RECORD 2 Project ID: 0120334000 GPJ Date: 38/2005 5												
Project Form Well, PUKIGE RECORD 2. Project ID: 01203340.00.0FP Dute: 38/2005												
Paper Form: WELL PURGE RECORD 2 Project ID: 01203340.00 GPJ Dute: 38/2005												
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Potrt Form: WE-LL PURGE RECORD 2 Project ID: 01203340 00 GPJ Date:	3/8/20											
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	S EN	G   1	NEEF	RS		20	PURGE 005 - 1st Qu	ıarter	RD		WELL NUMBER MW-12
PROJECT	Woolse	Drilling A	& Pump C	o Ino		JOB NUMBE	R 6 <b>340.00</b>	SITE 6100 S	ahastanal		RECORDED BY  Amy Yardley
	weeks								ebastopol		
HAND PUI		<i>MET</i>	GING THOD	SAMPLIN METHOL		for 2" dia	n. wells), unto or until dry.	til water pa	rameters (	pH, temp.,	es (or 5 gallons m inimun cond.) have stabilized
BAILER OTHER	SIBLE PUMP		<u>x</u>	X		* Oil/wat Exceeded	er interface , i.e. >999 N	probe used TU's). Ted	to check f chnician no	for NAPLs; oted strong	MLE = Meter Limit hydrocarbon odor.
CASING	DIAMETER	(D <sub>c</sub> ):2.0	)	- ID		DATE OF	SAMPLING:			:	2/7/2005
DEPTH 1	ГО:		Т	$\rightarrow$ D <sub>C</sub>	GROUND (E)	WEATHE	R:				Sunny
WATE	R (h):	4.5	<u>1</u>	<b>一</b> 尉	SURFACE	TAGGED	WATER LEV	ELS FROM	TOC:	4	.51 / 4.51
NAPL:		n.a	* -0.40	h		TAGGED	WELL DEPT	H FROM TO	C:		16.45
NAPL TH	ICKNESS:	n.a	.*		$\left.\right\}$ $\left.\right $ H	PURGE V	OLUME (3 C	ASING VOLU	JMES):	5.	.9 gallons
SCREEN	DEPTH:			n			O WATER F				ft. below TOC
TOP:		6.4	1	_	TDc		SAMPLING:	01100701120		0.01	16:05
вотто	OM:	16.	4	¥   ] ₹	<u>                                     </u>		O WATER A	T TIME OF S	AMPLING:	4 55	ft. below TOC
TOTAL D	EPTH (TD <sub>c</sub>	.): 16.9	90		SCREEN				AMPLING.	4.55	
Diameters in	n (inches) : De	epths in (feet)			INTERVAL		ANCE OF SAI	MPLE:	_		Clear
ONE CASI	NE CASING VOLUME:  D <sub>c</sub> - H] [3.14 (D <sub>c</sub> / 2) <sup>2</sup> ] [7.48 gal/ft <sup>3</sup> ]:  1.96 gallons				<u> </u>	LABORA					tical Sciences
[ID <sub>C</sub> = II][	[D <sub>C</sub> - H] [3.14 (D <sub>C</sub> / 2) <sup>2</sup> ] [7.48 gal/ft <sup>3</sup> ]: 1.96 gallo				JLATIVE	SEE CHA	IN OF CUST	ODY FORM I	OR ANALY	TICAL INFOR	RMATION.
	PURGING DATA  TIME WATER			REMOVED		WATER	CHARACTE	RISTICS		COMMENTS	
DATE	TIN BEGIN	ME FINISH	WATER REMOVED (GAL)	GAL	CASING VOLUMES	pН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	
2/7/05	13:13	13:14	1	1	0.51	7.20	1.720	*MLE	17.2	0.45	
2/7/05	13:14	13:16	2	3	1.53	7.04	1.750	*MLE	16.5	0.36	
2/7/05	13:16	13:19	3	6	3.07	7.08	1.850	*MLE	17.2	0.47	
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											<del> </del>

		S E N	I G I I	NEEF	R S		20	PURGE 005 - 1st Qu	arter	RD		WELL NUMBER MW-13
P	ROJECT	Weeks	Drilling &	& Pump C	o., Inc.		JOB NUMBER 01203	R 340.00	SITE 6100 S	ebastopol		RECORDED BY  Amy Yardley
	BAILER		PUR MET	GING 'HOD	SAMPLIN METHOL		(±10%), o	. wells), unt or until dry.	nimum of 3 til water pa	wetted cas rameters ()	sing volume pH, temp., o	s (or 5 gallons m inimum cond.) have stabilized  MLE = Meter Limit
	CASING I	DIAMETER	(D <sub>c</sub> ):2.0	)	- 10		DATE OF	SAMPLING:				2/7/2005
	DEPTH T	O:			$\rightarrow$ $D_{\rm C}$	GROUND (E)	WEATHE	R:				Sunny
	WATER	R (h):	4.7		<u> </u>	SURFACE	TAGGED	WATER LEV	ELS FROM	TOC:	4	.73 / 4.73
	NAPL:		n.a	-0.50	h		TAGGED	WELL DEPT	H FROM TO	C:		14.35
		ICKNESS:	n.a	.*	h	Н	PURGE V	OLUME (3 C	ASING VOLU	IMES):	4.	8 gallons
	SCREEN TOP:	DEPTH:	4.5	5		$TD_{c}$	DEPTH T	O WATER FO	OR 80% REC	HARGE:	6.68 f	ft. below TOC
	BOTTO	DM:	14.		<u> </u>   <u> </u>	<u> </u>	TIME OF	SAMPLING:				15:50
		EPTH (TD <sub>o</sub>				SCREEN	DEPTH T	O WATER A	T TIME OF S	AMPLIN <u>G:</u>	4.74 f	ft. below TOC
		(inches) : De				INTERVAL	APPEARA	ANCE OF SAI	MPLE:			Clear
	ONE CASII	NG VOLUME	:			:	LABORAT	ΓORY:			Analy	tical Sciences
L	[TD <sub>c</sub> - H] [3	O <sub>c</sub> - H] [3.14 (D <sub>c</sub> / 2) <sup>2</sup> ] [7.48 gal/ft <sup>2</sup> ]: 1.59 gallo		ns		SEE CHA	IN OF CUST	ODY FORM F	OR ANALY	TICAL INFOR	RMATION.	
		PURGIN	G DATA			JLATIVE REMOVED		WATER	CHARACTE	RISTICS		COMMENTS
	DATE	BEGIN	FINISH	WATER REMOVED (GAL)	GAL	CASING VOLUMES	pН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	
	2/7/05	13:39	13:40	1	1	0.63	7.26	2.960	*MLE	18.0	0.60	
	2/7/05	13:40	13:42	2	3	1.88	7.17	2.970	*MLE	17.6	0.61	
	2/7/05	13:42	13:45	2	5	3.14	7.10	2.900	*MLE	17.6	0.46	
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Report Form: WELL PURGE RECORD 2 Project ID: 01203340.00.GPJ Date: 3/8/2005												
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	CS EN	I G I I	NEEI	RS		20	PURGE 005 - 2nd Qu	uarter	RD		WELL NUMBER  MW- 1
PROJEC		s Drilling o	& Pump C	o., Inc.		JOB NUMBE. 01203	R 3 <b>340.00</b>	SITE <b>6100 S</b>	Sebastopol		RECORDED BY  J. Greenlee / A. Yardle
	PUMP ERSIBLE PUMP R	PUR MET	RGING THOD	SAMPLING METHOL		(±10%), ( REMARKS * Oil/wat	n. wells), unt or until dry.	nimum of 3 til water pa	wetted cas rameters (	sing volume pH, temp.,	es (or 5 gallons m inimun cond.) have stabilized MLE = Meter Limit
DEPT WA NA	EPTH TO:  WATER (h):  NAPL:  1.0.50  NAPL:  APL THICKNESS:  CREEN DEPTH:  TOP:  4.0  BOTTOM:  DTAL DEPTH (TDc):  14.00  ameters in (inches): Depths in (feet)			→ D <sub>C</sub>	GROUND (FM) SURFACE	WEATHE TAGGED TAGGED	SAMPLING: R: WATER LEV WELL DEPT	H FROM TO	OC:	3	5/5/2005 Overcast 3.78 / 3.78 14.08
TO BO TOTA Diamet	P: TTOM: AL DEPTH (TD	the pths in (feet)	.0	<b>▼</b>	TD <sub>C</sub>	DEPTH T TIME OF DEPTH T APPEARA LABORA	O WATER FO SAMPLING: O WATER A'	OR 80% REC T TIME OF S MPLE:	CHARGE:  AMPLING:	5.72 · 4.21 · Analy	ft. below TOC  15:08  ft. below TOC  Clear  rtical Sciences
DATE	TI	ME FINISH	WATER REMOVED (GAL)	TOTAL F	CASING VOLUMES	рН	WATER  CONDUC- TIVITY (mmhos/cm)	CHARACTE TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	COMMENTS
5/5/0:		13:25	1	1	0.63	7.06	1.600	*MLE	17.9	3.84	
5/5/0	5 13:25	13:27	2	3	1.89	6.99	1.640	353	17.5	3.07	
5/5/0:	5 13:27	13:28	2	5	3.15	7.01	1.540	62	17.4	2.52	
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D.Z. Project D.: 01205340.00CsF Date; 5/11/2005											
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	SEN	IGIN	NEEF	RS		20	PURGE 005 - 2nd Qu	uarter	RD		WELL NUMBER  MW- 2
PROJECT	Weeks	Drilling &	& Pump C	o., Inc.		JOB NUMBE 01203	R 3 <b>340.00</b>	SITE 6100 S	Sebastopol		RECORDED BY  J. Greenlee / A. Yardle
HAND PUN SUBMERS BAILER OTHER	MP IBLE PUMP		GING 'HOD	SAMPLING METHOE		for 2" dia (±10%), on REMARKS * Oil/wat	a. wells), unt or until dry.	til water pa	rameters (	рН, temp.,	es (or 5 gallons m inimum cond.) have stabilized  MLE = Meter Limit
DEPTH T WATER NAPL: NAPL TH SCREEN TOP: BOTTO TOTAL D Diameters in	R (h):  ICKNESS:  DEPTH:  DM:  EPTH (TDc n (inches): De	3.8 n.a n.a 4.0 12.0 12.0 epths in (feet)	8 * -0.60 .*		GROUND (FM) SURFACE (FM) H TD <sub>C</sub>	WEATHE TAGGED TAGGED PURGE V DEPTH T TIME OF DEPTH T APPEARV LABORA	WATER LEV WELL DEPT OLUME (3 C. O WATER FO SAMPLING: O WATER A	TH FROM TO ASING VOLU OR 80% REG T TIME OF S MPLE:	DC:  JMES):  CHARGE:  SAMPLING:	3 5.38 5.03 Analy	5/5/2005 Overcast 0.87 / 3.88 12.04 .7 gallons ft. below TOC 15:45 ft. below TOC Clear trical Sciences RMATION.
DATE -	PURGING DATA  TIME WATER	WATER REMOVED (GAL)		CASING VOLUMES	рН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	COMMENTS	
5/5/05	13:58	13:59	1	1	0.81	7.19	1.320	10	18.1	2.79	
5/5/05	13:59	14:01	2	3	2.44	7.02	1.270	10	17.6	1.96	

		S E N	I G I I	NEEF	R S		20	PURGE 05 - 2nd Qu	uarter	RD		WELL NUMBER MW- 3
	PROJECT	Weeks	Drilling &	& Pump C	o., Inc.		JOB NUMBER 01203	R 3 <b>40.00</b>	SITE <b>6100 S</b>	Sebastopol		RECORDED BY  J. Greenlee / A. Yardley
	HAND PUN SUBMERS BAILER OTHER		PUR MET	GING	SAMPLIN METHOL		(±10%), o	n. wells), unt or until dry.	inimum of 3 til water pa	wetted cas rameters ()	oing volume oH, temp., o	s (or 5 gallons m inimum cond.) have stabilized  MLE = Meter Limit
			(D.)				DATE OF	044451410				
	DEPTH T WATEI NAPL:	O:	(D <sub>c</sub> ): 2.0	6 <u>¥</u>	D <sub>c</sub>	GROUND (FM)	WEATHE TAGGED	SAMPLING: R: WATER LEV WELL DEPT			(	77 / 4.76 12.06
	NAPL TH SCREEN TOP:	ICKNESS: DEPTH:	n.a	*	h	H TDc	PURGE V	'OLUME (3 C. O WATER FO SAMPLING:	ASING VOLU	JMES):		2 gallons ft. below TOC
	TOTAL D Diameters in	### TIME ####################################		¥   ¥	SCREEN INTERVAL	APPEARA LABORAT		MPLE:	_	Analy	ft. below TOC  Clear  tical Sciences	
	[1D <sub>C</sub> - H][3			1.07 gallol	CUMU	JLATIVE	SEE CHA	WATER	CHARACTE	-	TICAL INFOR	COMMENTS
	DATE			WATER REMOVED (GAL)	GAL	CASING VOLUMES	pН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	
	5/5/05	13:07	13:08	1	1	0.94	6.76	1.420	136	18.0	2.55	
	5/5/05	13:08	13:10	2	3	2.81	6.87	1.300	10	17.5	3.46	
	5/5/05	13:10	13:12	2	5	4.68	6.73	1.610	*MLE	17.5	2.03	Well dry
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Report Form: WELL PURGE RECORD 2 Project ID: 01203340.00.GPJ Date: 5/11/2005												
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		S E N	I G I I	NEEF	R S		20	PURGE 005 - 2nd Qu	uarter	RD		WELL NUMBER  MW- 4D
	PROJECT	Weeks	Drilling &	& Pump C	o., Inc.		JOB NUMBER 01203	R 3 <b>40.00</b>	SITE <b>6100 S</b>	Sebastopol		RECORDED BY  J. Greenlee / A. Yardley
	HAND PUN SUBMERS BAILER OTHER		PUR MET	GING	SAMPLIN METHOL		(±10%), o	n. wells), unt or until dry.	til water pa	rameters (J	pH, temp., c	s (or 5 gallons m inimum cond.) have stabilized  MLE = Meter Limit
		DIAMETER	(D <sub>c</sub> ): 2.0	 )			DATE OF	SAMPLING:				5/6/2005
	DEPTH T WATEI NAPL:	O:	46.4 	49 <u>¥</u>	D <sub>C</sub>	GROUND (FM)	WEATHE TAGGED				(	Dvercast
	NAPL TH SCREEN TOP:	ICKNESS: DEPTH:	n.a 40.			$H$ $TD_{c}$	DEPTH T	OLUME (3 C.O WATER FO SAMPLING:		′ —		4 gallons ft. below TOC
	TOTAL D Diameters in	BOTTOM: 50.0  TAL DEPTH (TD <sub>c</sub> ): 50.00  meters in (inches) : Depths in (feet)  E CASING VOLUME:  C - H] [3.14 (D <sub>c</sub> / 2) <sup>2</sup> ] [7.48 gal/ft <sup>3</sup> ]: 0.47 gallons  PURGING DATA			¥   ¥	SCREEN INTERVAL		O WATER ATANCE OF SAITORY:		AMPLIN <u>G:</u>		ft. below TOC  Clear  tical Sciences
	[ID <sub>C</sub> - H][3			0.47 gallol	CUML	JLATIVE	SEE CHA	WATER	ODY FORM F		TICAL INFOR	COMMENTS
	DATE			WATER REMOVED (GAL)	GAL	CASING VOLUMES	pН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	GOMMENTO
	5/6/05	13:45	13:50	1	1	2.11	7.91	0.747	*MLE	18.5	2.40	Very slow recharge
	5/6/05	13:50	13:51	0	1	2.11	n.a.	n.a.	n.a.	n.a.	n.a.	Well dry
	5/6/05	13:51	14:00	0	1	2.11	n.a.	n.a.	n.a.	n.a.	n.a.	Recharge
	5/6/05	14:00	14:05	1	2	4.21	7.88	0.546	*MLE	18.4	1.68	Well dry
05												
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		S E N	I G I I	NEEF	RS		20	PURGE 05 - 2nd Qu	uarter	RD		WELL NUMBER  MW- 5
	PROJECT	Weeks	Drilling &	& Pump C	o., Inc.		JOB NUMBER 01203	340.00	SITE <b>6100 S</b>	Sebastopol		RECORDED BY  J. Greenlee / A. Yardley
	HAND PUN SUBMERS BAILER OTHER	MP BIBLE PUMP		GING CHOD	SAMPLIN METHOL		(±10%), o	. wells), unt or until dry.	til water pa	rameters ()	pH, temp.,	s (or 5 gallons minimum cond.) have stabilized  MLE = Meter Limit
-		DIAMETED	(D.): 0.0				DATE OF	CAMPI INC.				F/F/2005
	DEPTH T WATEI		(D <sub>c</sub> ):	5 <u>*</u>	D <sub>c</sub>	GROUND (FM)	WEATHE TAGGED	WATER LEV			(	Overcast
		ICKNESS: DEPTH:	n.a 5.0	* -0.57	h	H     TD <sub>c</sub>	PURGE V	WELL DEPT OLUME (3 C. O WATER FO	ASING VOLU	JMES):		15.06 4 gallons ft. below TOC
		DM: EPTH (TD <sub>C</sub> n (inches) : De			¥	SCREEN INTERVAL	DEPTH T	SAMPLING: O WATER A <sup>T</sup> ANCE OF SAI FORY:		AMPLIN <u>G:</u>		16:00 ft. below TOC Clear tical Sciences
L		NG VOLUME 3.14 (D <sub>c</sub> / 2) <sup>2</sup> ]		1.81 gallo	ns_			IN OF CUST	ODY FORM I	OR ANALY		
		PURGIN	G DATA			ILATIVE REMOVED		WATER	CHARACTE	ERISTICS		COMMENTS
	DATE	BEGIN	ME FINISH	WATER REMOVED (GAL)	GAL	CASING VOLUMES	рН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	
	5/5/05	12:30	12:31	1	1	0.55	7.06	0.971	905	16.8	3.03	
	5/5/05	12:31	12:33	2	3	1.66	7.02	1.260	389	16.3	2.95	
	5/5/05	12:33	12:36	3	6	3.32	6.88	1.170	10	16.3	1.81	
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S C	SEN	I G I I	NEEF	R S			PURGE 005 - 2nd Qu		RD		WELL NUMBER  MW- 6  RECORDED BY
PROJECI	Weeks	Drilling &	& Pump C	o., Inc.			340.00		Sebastopol		J. Greenlee / A. Yardle
	.,, ceris		GING	SAMPLIN	C				_		es (or 5 gallons m inimum
HAND PU	MP		THOD	METHOL		for 2" dia	n. wells), unt or until dry.	til water pa	rameters (	pH, temp.,	cond.) have stabilized
SUBMERS	SIBLE PUMP		X				ou intouface	nucho usod	l to aboals t	For NADI a	MLE = Meter Limit
BAILER OTHER				X		Exceeded	, i.e. >999 N	TU's.	i to check i	or NAI Es,	WILE - Weter Limit
CASING	DIAMETER	(D <sub>c</sub> ):2.0	)	<b>→</b> D <sub>c</sub>	<b>-</b>	DATE OF	SAMPLING:				5/5/2005
DEPTH 7			<b>+</b>		GROUND SURFACE (FM)	WEATHE	R:				Overcast
WATE	. ,	3.1		<b>▼</b> 🖺			WATER LEV	ELS FROM	TOC:	3	.18 / 3.16
NAPL:		n.a	.* -0.32	h		TAGGED	WELL DEPT	H FROM TO	C:		15.48
NAPL TH	IICKNESS:	n.a	.*	h	H	PURGE V	OLUME (3 C	ASING VOLU	JMES):	5.	6 gallons
	I DEPTH:	<b>5</b> (	,			DEPTH T	O WATER F	OR 80% REC	CHARGE:	5.46	ft. below TOC
TOP:		5.0		<u> </u>	$TD_{c}$	TIME OF	SAMPLING:				14:25
BOTTO		15.				DEPTH T	O WATER A	T TIME OF S	AMPLING:	3.53	ft. below TOC
	DEPTH (TD <sub>c</sub>		00	<u></u>	SCREEN INTERVAL	APPEARA	ANCE OF SAI	MPLE:			Clear
	n (inches) : De			.==	:   ↓	LABORA <sup>-</sup>	ΓORY:			Analy	tical Sciences
	ING VOLUME 3.14 (D <sub>C</sub> / 2) <sup>2</sup> ]		1.88 gallor	ns		SEE CHA	IN OF CUST	ODY FORM I	FOR ANALY	TICAL INFO	RMATION.
	PURGIN	G DATA			JLATIVE REMOVED		WATER	CHARACTE	RISTICS		COMMENTS
DATE	TIN		WATER REMOVED (GAL)	GAL	CASING VOLUMES	рН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	
	BEGIN	FINISH					,				
5/5/05	12:50	12:51	1	1	0.53	7.00	0.690	10	16.6	2.72	
5/5/05	12:51	12:53	2	3	1.60	6.86	0.774	10	15.9	4.05	
5/5/05	12:53	12:56	3	6	3.19	6.79	0.696	10	15.7	2.13	

		S E N	I G I I	NEEF	R S		20	PURGE 005 - 2nd Qu	uarter	RD		WELL NUMBER  MW- 7
	PROJECT	Weeks	Drilling &	& Pump C	o., Inc.		JOB NUMBER 01203	R 3 <b>340.00</b>	SITE <b>6100 S</b>	Sebastopol		RECORDED BY  J. Greenlee / A. Yardley
	HAND PUN SUBMERS BAILER OTHER		PUR MET	GING CHOD	SAMPLINI METHOL		(±10%), o	n. wells), unt or until dry.	til water pa	rameters ()	pH, temp.,	es (or 5 gallons m inimum cond.) have stabilized  MLE = Meter Limit
	DEPTH T WATE NAPL: NAPL TH SCREEN TOP: BOTTO	R (h): ICKNESS: DEPTH: DM:	4.2 n.a n.a 5.0	8 * -0.24	D <sub>C</sub>	GROUND (FM) SURFACE (FM) H TD <sub>C</sub>	WEATHE TAGGED TAGGED PURGE V DEPTH T TIME OF	SAMPLING: R: WATER LEV WELL DEPT OLUME (3 C. O WATER FO SAMPLING: O WATER A	TH FROM TO ASING VOLU OR 80% REC	C: JMES): CHARGE:	5. 6.38	5/6/2005 Overcast .28 / 4.28
	Diameters in	PEPTH (TD <sub>C</sub> n (inches) : De NG VOLUME n:14 (D <sub>C</sub> / 2) <sup>2</sup> ]	epths in (feet)			SCREEN INTERVAL	LABORAT	ANCE OF SAI TORY: JIN OF CUSTO		FOR ANALY		Clear tical Sciences RMATION.
	DATE	PURGIN		WATER REMOVED (GAL)		CASING VOLUMES	рН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	COMMENTS
	5/6/05	14:31	14:32	1	1	0.58	7.89	0.160	*MLE	18.1	6.45	
	5/6/05	14:32	14:34	2	3	1.75	7.21	1.050	432	17.4	0.97	
	5/6/05 5/6/05	14:34	14:36	1	6	3.51	7.10	1.460	10	17.1	1.47	
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		S E N	I G I I	NEEF	R S		20	PURGE 005 - 2nd Qu	uarter	RD		WELL NUMBER  MW- 8
	PROJECT	Weeks	Drilling &	& Pump C	o., Inc.		JOB NUMBER 01203	R 3 <b>40.00</b>	SITE <b>6100 S</b>	Sebastopol		RECORDED BY  J. Greenlee / A. Yardley
	HAND PUN SUBMERS BAILER OTHER	/IP IBLE PUMP		GING CHOD	SAMPLIN METHOL		(±10%), o	n. wells), unt or until dry.	til water pa	rameters ()	pH, temp.,	es (or 5 gallons minimum cond.) have stabilized  MLE = Meter Limit
		DIAMETER	(D°). 5 (	 )			DATE OF	SAMPLING:				5/5/2005
	DEPTH T WATE	O:	5.0	2 <u>*</u>	→ D <sub>c</sub>	GROUND (FM)	WEATHE		/ELS FROM	TOC:	(	Overcast
	NAPL: NAPL TH SCREEN TOP:	ICKNESS: DEPTH:	n.a n.a	* *	h	H   TD <sub>c</sub>	PURGE V	WELL DEPT OLUME (3 C. O WATER FO	ASING VOLU	JMES):		15.24 8 gallons ft. below TOC
		DM: EPTH (TD <sub>c</sub> n (inches) : De		0 -	¥ ¥	SCREEN INTERVAL	DEPTH T	SAMPLING:  O WATER A  ANCE OF SAI		AMPLIN <u>G:</u>		15:20  ft. below TOC  Clear
		NG VOLUME .14 (D <sub>c</sub> / 2) <sup>2</sup> ]		1.59 gallo	ns	<u> </u>	SEE CHA	IN OF CUST	ODY FORM I	OR ANALY		tical Sciences RMATION.
		PURGIN	G DATA			JLATIVE REMOVED		WATER	CHARACTE	ERISTICS		COMMENTS
	DATE	BEGIN	FINISH	WATER REMOVED (GAL)	GAL	CASING VOLUMES	рН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	
	5/5/05	13:41	13:42	1	1	0.63	6.87	3.230	684	16.9	3.24	
	5/5/05	13:42	13:44	2	3	1.89	6.83	3.300	193	16.4	3.56	
	5/5/05	13:44	13:46	2	5	3.15	6.80	3.280	10	16.3	2.98	
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	S C	SEN	IGIN	NEEF	RS			PURGE		RD		WELL NUMBER  MW-10D
	PROJECT						JOB NUMBER	<mark>05 - 2nd Q</mark> ı R	siter Site			RECORDED BY
		Weeks	Drilling &	& Pump C	o., Inc.			340.00		Sebastopol		J. Greenlee / A. Yardley
				GING THOD	SAMPLIN METHOL		PURGING CK	RITERIA Mi . wells), unto or until dry.	il water pa	wetted cas rameters (p	ing volume oH, temp., o	s (or 5 gallons minimum cond.) have stabilized
	HAND PUN						REMARKS	n until di y.				
	SUBMERS BAILER	IBLE PUMP		<u> </u>			* Oil/wate	er interface	probe used	to check f	or NAPLs;	MLE = Meter Limit
	OTHER				X	_	Exceeded	, i.e. >999 N	TU's.			
		DIAMETER	(D <sub>c</sub> ):2.0	)	→ D <sub>c</sub>	<b>←</b>		SAMPLING:				5/6/2005
	DEPTH T WATE		46.1	10 🔻		GROUND (S)	WEATHE					Overcast
	NAPL:	<b>(</b> 11).	n.a.	*	▼隣			WATER LEV			46	5.2 / 46.19
		ICKNESS:	n.a.	-0.41	h	}		WELL DEPT				55.61
	SCREEN				h	Н		OLUME (3 C				4 gallons
	TOP:	DEF III.	44.	5	1	$TD_{\rm C}$		O WATER FO	OR 80% REC	CHARGE:	47.97	ft. below TOC
	ВОТТО	DM:	54.	 5 -	¥_∐₹	<u> </u>	TIME OF	SAMPLING:				16:10
	TOTAL D	EPTH (TD <sub>c</sub>	.): 55.5	50		SCREEN	DEPTH T	O WATER A	T TIME OF S	AMPLING:	47.88	ft. below TOC
	Diameters ir	n (inches) : De	epths in (feet)			INTERVAL	APPEARA	ANCE OF SAM	MPLE:		Ve	ery cloudy
	ONE CASI	NG VOLUME:	:				LABORAT	TORY:			Analy	tical Sciences
	[TD <sub>c</sub> - H] [3	3.14 (D <sub>C</sub> / 2) <sup>2</sup> ]	[7.48 gal/ft³]:	1.45 gallor			SEE CHA	IN OF CUSTO	ODY FORM F	FOR ANALY	TICAL INFOR	RMATION.
		PURGIN	G DATA			ILATIVE REMOVED		WATER	CHARACTE	RISTICS		COMMENTS
	DATE	BEGIN	ME FINISH	WATER REMOVED (GAL)	GAL	CASING VOLUMES	рН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	
	5/6/05	15:00	15:01	1	1	0.69	8.03	1.570	*MLE	18.5	0.70	
	5/6/05	15:01	15:04	1	2	1.38	7.93	1.620	*MLE	18.9	2.10	
	5/6/05	15:04	15:07	1	3	2.07	7.85	1.670	*MLE	19.1	1.73	
	5/6/05	15:07	15:10	1	4	2.75	7.98	1.690	*MLE	19.2	1.83	
	5/6/05	15:10	15:14	1	5	3.44	7.96	1.660	*MLE	19.2	1.91	
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	PROJECT						JOB NUMBER	<u>05 - 2nd Qւ</u>	uarter   SITE			RECORDED BY
	TROOLET	Weeks	Drilling &	& Pump Co	o., Inc.			340.00		Sebastopol		J. Greenlee / A. Yardley
			PUR MET	GING HOD	SAMPLING METHOL		PURGING CR	. wells), unt	til water pa	wetted cas rameters (p	ing volume oH, temp., c	s (or 5 gallons m inimum ond.) have stabilized
	HAND PUN	ИP					(±10%), 0	or until dry.				
		IBLE PUMP		<u> </u>				er interface	probe used	l to check f	or NAPLs:	MLE = Meter Limit
	BAILER OTHER				X		Exceeded	, i.e. >999 N	TU's.			
		DIAMETER	(D <sub>c</sub> ):2.0	)	<b>→</b> D <sub>c</sub>	<b>←</b>		SAMPLING:				5/6/2005
	DEPTH T WATE		4.1	8 <u>¥</u>		GROUND SURFACE (S)	WEATHE					Overcast
	NAPL:	<b>(11)</b> .	n.a.	*	▼隣			WATER LEV			4.	18 / 4.18
		ICKNESS:	n.a.	-0.47	h	}		WELL DEPT				16.02
	SCREEN				h	Н		OLUME (3 C				0 gallons
	TOP:	DEF III.	6.5	5	1	$TD_{\rm C}$		O WATER FO	OR 80% REC	CHARGE:	6.65 f	t. below TOC
	вотто	DM:	16.	<del></del> 5 -	¥_∐₹	<u> </u>		SAMPLING:				16:00
	TOTAL D	EPTH (TD <sub>c</sub>	.): 17.0	00		SCREEN	DEPTH T	O WATER A	T TIME OF S	AMPLING:	5.00 f	t. below TOC
		n (inches) : De				INTERVAL	APPEARA	ANCE OF SAM	MPLE:			Clear
	ONE CASI	NG VOLUME	· · · ·				LABORAT	TORY:			Analyt	ical Sciences
				2.02 gallor		J A T D (F	SEE CHA	IN OF CUSTO	ODY FORM F	OR ANALY	TICAL INFOR	RMATION.
		PURGIN	G DATA			ILATIVE REMOVED		WATER	CHARACTE	RISTICS		COMMENTS
	DATE	BEGIN	FINISH	WATER REMOVED (GAL)	GAL	CASING VOLUMES	pН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	
	5/6/05	14:40	14:41	1	1	0.50	7.39	1.630	*MLE	17.4	1.52	
	5/6/05	14:41	14:43	2	3	1.49	7.28	1.620	*MLE	17.4	1.44	
	5/6/05	14:43	14:45	2	5	2.48	7.25	1.660	*MLE	17.3	1.46	
	5/6/05	14:45	14:46	1	6	2.98	7.19	1.680	620	17.2	1.41	
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		S E N	I G I I	NEEF	R S		20	PURGE 005 - 2nd Qu	uarter	RD		WELL NUMBER MW-12
	PROJECT	Weeks	Drilling &	& Pump C	o., Inc.		JOB NUMBE. 01203	R 3 <b>40.00</b>	SITE <b>6100 S</b>	Sebastopol		RECORDED BY  J. Greenlee / A. Yardley
	HAND PUN SUBMERS BAILER OTHER		PUR MET	GING	SAMPLIN METHOL		(±10%), o	n. wells), unt or until dry.	til water pa	rameters ()	pH, temp.,	es (or 5 gallons m inimum cond.) have stabilized  MLE = Meter Limit
	DEPTH T WATEI NAPL:	R (h):	(D <sub>c</sub> ): 2.0 4.2 n.a n.a	6 -0.35	→ D <sub>C</sub>	GROUND (S) SURFACE (S) H TD <sub>C</sub>	WEATHE TAGGED TAGGED PURGE V DEPTH T	WATER LEV WELL DEPT OLUME (3 C. O WATER FO	TH FROM TO ASING VOLU	JMES):	6.	5/6/2005 Overcast .25 / 4.26 16.41 0 gallons ft. below TOC
	Diameters in	EPTH (TD <sub>C</sub> n (inches) : De	epths in (feet)			SCREEN INTERVAL	DEPTH T APPEARA LABORA	SAMPLING: O WATER A' ANCE OF SAI FORY: IN OF CUSTO	MPLE:	_	Analy	17:10  ft. below TOC  Clear  tical Sciences  RMATION.
	DATE	PURGIN		WATER REMOVED (GAL)		CASING VOLUMES	рН	CONDUC- TIVITY (mmhos/cm)	TURBIDITY (NTU)	TEMPER- ATURE (°C)	DISSOLVED OXYGEN (ppm)	COMMENTS
	5/6/05	16:20	16:21	1	1	0.50	7.48	1.450	*MLE	18.0	1.34	
	5/6/05	16:21	16:23	2	3	1.50	7.22	1.800	*MLE	17.7	1.32	
	5/6/05 5/6/05	16:23 16:25	16:25 16:26	1	6	2.49	7.14	1.860	*MLE  *MLE	17.5 17.5	0.77	
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	PROJECT						JOB NUMBER	05 - 2nd Qu	site			RECORDED BY
	FROJECI	Weeks	Drilling &	& Pump C	o., Inc.			340.00		ebastopol :		J. Greenlee / A. Yardley
ŀ				GING	SAMPLIN	G.	PURGING CR	AITERIA Mi	nimum of 3	wetted cas	ing volume	s (or 5 gallons m inimum
				THOD	METHOL		for 2" dia	. wells), unt or until dry.	til water pa	rameters (p	oH, temp., c	ond.) have stabilized
	HAND PUN						REMARKS	n until di y.				
	SUBMERS BAILER	IBLE PUMP		<u> </u>			* Oil/wate	er interface	probe used	to check f	or NAPLs;	MLE = Meter Limit
	OTHER				X		Exceeded	, i.e. >999 N	TU's.			
	CASING I	DIAMETER	(D <sub>C</sub> ): 2.0	)			DATE OF	SAMPLING:				5/6/2005
	DEPTH T		(=6).		$\rightarrow$ $D_C$	GROUND	WEATHE					Overcast
	WATER		4.6	9 🔻	<u>   </u>	GROUND SURFACE (S)		WATER LEV	/FLS FROM	TOC:		68 / 4.69
	NAPL:		n.a.	.* <b>↑</b> :*	h			WELL DEPT				14.24
	NAPL TH	ICKNESS:	n.a.	*	] }	H		OLUME (3 C			4	3 gallons
	SCREEN	DEPTH:			h \\	П 		O WATER FO				t. below TOC
	TOP:		4.5	5	3_	$TD_{C}$		SAMPLING:	OT 00 70 TKEC	n in trock.	0.001	17:25
	BOTTO	DM:	14.	5	¥	<del></del>		O WATER A <sup>-</sup>	T TIME OE S	AMPLING:	5 17 f	t. below TOC
	TOTAL D	EPTH (TD <sub>c</sub>	;):15.0	00		SCREEN		ANCE OF SAM		AMPLING.	3.17 1	Clear
	Diameters in	(inches) : De	epths in (feet)			INTERVAL			VIPLE.		Analid	
		NG VOLUME		1.60 gallor	ns E		LABORAT	IN OF CUSTO				ical Sciences
ŀ	[011-					ILATIVE	SEE CHA				TICAL INFOR	
		PURGIN	IG DATA			REMOVED		WATER	CHARACTE	RISTICS		COMMENTS
		TIM	ME	WATER		CASING		CONDUC-	TURBIDITY	TEMPER-	DISSOLVED	
	DATE	BEGIN	FINISH	REMOVED (GAL)	GAL	VOLUMES	pН	TIVITY (mmhos/cm)	(NTU)	ATURE (°C)	OXYGEN (ppm)	
İ	5/6/05	16:45	16:46	1	1	0.62	7.54	2.830	*MLE	18.6	1.82	
	5/6/05	16:46	16:48	2	3	1.87	7.27	2.420	*MLE	18.8	1.42	
	5/6/05	16:48	16:50	2	5	3.12	7.24	2.430	686	18.8	1.53	
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# **Appendix D**

Well Survey Report dated March 9, 2005

#### JACOBS LAND SURVEYING 1625 PERSEUS CT. PETALUMA, CA. 94954 (707) 782-0733

**DATE**: 03-09-05

Job # 03-918-S

TO: SCS Engineers

3645 Westwind Blvd.

Santa Rosa, California 95403

RE: Weeks Drilling & Pump 6100 Sebastopol Rd. Sebastopol, Ca. Your Job No. 3340.00

On 03-09-05 this office ran a closed level loop with a Zeiss Ni2 Auto Level from a previously established Temporary Benchmark, elevation 69.86, NGVD 1929 datum, yielding the following well elevations.

MW#	Rim	Top Casing	Comments
MW-10- MW-11 MW-12 MW-13	-D 69.57 69.66 69.41 69.44	69.16 69.19 69.06 68.95	(S) (N) (S) (N) (S) (N) (P) (S) (N)
KEY	(A) = Allen head bolt (N)(E)(S)(W) = Direction (M) = Missing/stripped bolt (P)= Pressure	(L) = Large bolt (B) = Black mark (OC) = Outer casing (OG) = Original grade	(S) = Small bolt (BN)=Black mark/notch (HP) = High point

Temporary Benchmark: Corner, end of concrete sidewalk at SE corner office.

Job Benchmark: USC&GS monument Y 204, published elevation 65.55, 1929 NGVD.

#### **REMARKS**:

All wells recovered and observed were in good condition and were resealed as found.

Steven H. Jacobs PLS 5296 Lic. Exp

1-05

5296

## Appendix E

Analytical Sciences Report #5012106 dated January 31, 2005 Analytical Sciences Report #5020801 dated February 28, 2005 Analytical Sciences Report #5032804 dated April 8, 2005 Analytical Sciences Report #5050903 dated May 20, 2005

Report Date: January 28, 2005

Stephen Knuttel SCS Engineers 3645 Westwind Blvd. Santa Rosa, CA 95403

#### LABORATORY REPORT

Project Name: Weeks Drilling & Pump Co. 01203340.00

Lab Project Number: 5012106

This 13 page report of analytical data has been reviewed and approved for release.

Mark A. Valentini, Ph.D. Laboratory Director

PO Box 750336 Petaluma, CA 94975-0336 Telephone: (707) 769-3128 110 Liberty Street Petaluma, CA 94952 Fax: (707) 769-8093



#### **TPH Gasoline in Soil**

<b>Lab #</b> 27886	Sample II		alysis asoline	Result (mg/kg) ND	RDL (mg/kg) 1.0
Date Sampled: Date Received:		Date Analyzed: Method:	01/21/05 EPA 8015M	QC Ba	atch #: <u>5243</u>

27887	Sample MW-11@		nalysis iasoline	Result (mg/kg) ND	RDL (mg/kg) 1.0
Date Sampled: Date Received:		Date Analyzed: Method:		QC Ba	tch #: <u>5243</u>

27888	Sample ID MW-12@7.0'		alysis asoline	Result (mg/kg) 68	<b>RDL (mg/kg)</b> 10
Date Sampled: Date Received:		,	01/21/05 EPA 8015M	QC Ba	atch #:5243

<b>Lab #</b> 27889	Sample ID MW-12@11		Analysis /Gasoline	Result (mg/kg) ND	<b>RDL (mg/kg)</b> 1.0
Date Sampled: Date Received:		Date Analyze Metho		QC Ba	tch #: <u>5243</u>



Lab #	Sample ID	An	alysis	Result (mg/kg)	RDL (mg/kg)
27890	MW-13@6.0	0' TPH/G	asoline	ND	1.0
Date Sampled: Date Received:		Date Analyzed: Method:	01/21/05 EPA 8015M	QC	Batch #:5243

<b>Lab #</b> 27891	Sample I MW-13@1		Analysis /Gasoline	Result (mg/kg) ND	RDL (mg/kg) 1.0
Date Sampled: Date Received:		Date Analyze Metho		QC B	atch #: <u>5243</u>



### Volatile Hydrocarbons by GC/MS in Soil

Lab#	Sample ID	Compound	Name	Result (ug/kg)	RDL (ug/kg)
27886	MW-11@	benzene		ND	2.0
	6.0'	toluene		ND	2.0
		ethyl benzene		2.4	2.0
		m,p-xylene		ND	2.0
		o-xylene		ND	2.0
		Oxygenated Gasoli		ND	50
		tert-butyl alcohol (TE		ND	50 2.0
		methyl tert-butyl eth		ND ND	2.0
		di-isopropyl ether (D		ND ND	2.0
		ethyl tert-butyl ether tert-amyl methyl eth	• •	ND ND	2.0
Su	rrogates	Result (ug/kg) % Recovery		Acceptanc	e Range (%)
dibromofluo	oromethane (20)	20.3	102	70 -	- 130
toluene-d <sub>8</sub> (				- 130	
4-bromoflu	orobenzene (20)	19.5	97.5	70 -	- 130
Date Sampl Date Receiv		Date Analyzed: 01/2 Method: EPA	1/05 8260B	QC Batch #:	5250



Lab #	Sample ID	Compound	Name	Result (ug/kg)	RDL (ug/kg)
27887	MW-11@	benzene		ND	2.0
	11.0'	toluene		ND	2.0
		ethyl benzene		ND	2.0
		m,p-xylene		ND	2.0
		o-xylene		ND	2.0
		Oxygenated Gasoli	ne Additives		
		tert-butyl alcohol (TE	3A)	ND	50
		methyl tert-butyl eth	•	ND	2.0
		di-isopropyl ether (D	IPE)	ND	2.0
		ethyl tert-butyl ether	(ETBE)	ND	2.0
		tert-amyl methyl etho	er (TAME)	ND	2.0
Su	rrogates	Result (ug/kg)	% Recovery	Acceptan	ce Range (%)
dibromofluc	promethane (20)	20.3	102	70	<b>– 130</b>
toluene-d <sub>8</sub> (		19.7	98.5	70 – 130	
4-bromofluo	orobenzene (20)	19.1	95.5	70	<b>– 130</b>
Date Sampl Date Receiv		Date Analyzed: 01/2 Method: EPA	1/05 8260B	QC Batch #	t: <u>5250</u>



Lab #	Sample ID	Compound	Name	Result (ug/kg)	RDL (ug/kg)
27888	MW-12@	benzene		150	50
	7.0'	toluene		ND	50
		ethyl benzene		1,100	50
		m,p-xylene		5,500	50
		o-xylene		ND	50
		Oxygenated Gasoline Additives  tert-butyl alcohol (TBA) methyl tert-butyl ether (MTBE) di-isopropyl ether (DIPE) ethyl tert-butyl ether (ETBE) tert-amyl methyl ether (TAME)		ND ND ND ND	1,000 50 50 50 50
Sui	rrogates	Result (ug/kg)	% Recovery	Acceptan	ce Range (%)
dibromofluc	promethane (20)	20.1	100	70	<b>– 130</b>
toluene-d <sub>8</sub> (		19.4			
4-bromofluo	orobenzene (20)	19.4	97.0	70	<b>– 130</b>
Date Sample		Date Analyzed: 01/2 Method: EPA	2/05 8260B	QC Batch #	#: <u>5250</u>



Lab #	Sample ID	Compound l	Name	Result (ug/kg)	RDL (ug/kg)
27889	MW-12@	benzene		ND	2.0
	11.0'	toluene		ND	2.0
		ethyl benzene		2.1	2.0
		m,p-xylene		ND	2.0
		o-xylene		ND	2.0
		Oxygenated Gasoli	ne Additives		
		tert-butyl alcohol (TE	SA)	ND	50
		methyl tert-butyl ether (MTBE)		ND	2.0
		di-isopropyl ether (D	IPE)	ND	2.0
		ethyl tert-butyl ether	-	ND	2.0
		tert-amyl methyl etho	-	ND	2.0
Su	rrogates	Result (ug/kg)	% Recovery	Acceptanc	ce Range (%)
dibromofluc	promethane (20)	20.3	102	70	<b>–</b> 130
toluene-d <sub>8</sub> (	(20)	19.4	97.0	70 – 130	
4-bromofluo	orobenzene (20)	19.1	95.5	70	<b>– 130</b>
Date Sampl Date Receiv		Date Analyzed: 01/2 Method: EPA	1/05 8260B	QC Batch #	: _5250



Lab #	Sample ID	Compound	Name	Result (ug/kg)	RDL (ug/kg)
27890	MW-13@	benzene		ND	2.0
	6.0'	toluene		ND	2.0
		ethyl benzene		ND	2.0
		m,p-xylene		ND	2.0
		o-xylene		ND	2.0
		Oxygenated Gasoli	ne Additives		
		tert-butyl alcohol (TE	3A)	ND	50
		methyl tert-butyl eth	•	ND	2.0
		di-isopropyl ether (D	, ,	ND	2.0
		ethyl tert-butyl ether	-	ND	2.0
		tert-amyl methyl etho	-	ND	2.0
Su	rrogates	Result (ug/kg)	% Recovery	Acceptan	ce Range (%)
dibromofluc	promethane (20)	20.2	101	70	<b>– 130</b>
toluene-d <sub>8</sub> (		19.4	97.0	70 – 130	
4-bromofluo	orobenzene (20)	19.4	97.0	70	<b>– 130</b>
Date Sampl Date Receiv		Date Analyzed: 01/2: Method: EPA	2/05 8260B	QC Batch #	t: <u>5250</u>



Lab #	Sample ID	Compound	Name	Result (ug/kg)	RDL (ug/kg)
27891	MW-13@	benzene		ND	2.0
	11.0'	toluene		ND	2.0
		ethyl benzene		ND	2.0
		m,p-xylene		ND	2.0
		o-xylene		ND	2.0
		Oxygenated Gasoli	ne Additives		
		tert-butyl alcohol (TE	3A)	ND	50
		methyl tert-butyl eth	er (MTBE)	ND	2.0
		di-isopropyl ether (D	IPE)	ND	2.0
		ethyl tert-butyl ether	(ETBE)	ND	2.0
		tert-amyl methyl eth	er (TAME)	ND	2.0
Su	rrogates	Result (ug/kg)	% Recovery	Acceptance	ce Range (%)
dibromoflu	oromethane (20)	20.7	104	70	<b>–</b> 130
toluene-d <sub>8</sub>		19.7	98.5		<b>–</b> 130
4-bromoflu	orobenzene (20)	19.4	97.0	70	– 130
Date Sampl Date Receiv		Date Analyzed: 01/2 Method: EPA	2/05 8260B	QC Batch #	: _5250



#### **Total Lead in Soil**

<b>Lab #</b> 27888	Sample ID MW-12@7.0'	_	lysis b)	Result (mg/kg)	RDL (mg/kg) 3.0
Date Sampled: Date Received: Method:	01/20/05 01/21/05 EPA 3050/6010	Date Digested: Date Analyzed:	01/21/05 01/21/05	QC Ba	tch #: _5249



# LABORATORY QUALITY ASSURANCE REPORT

**QC Batch #**: 5243 **Lab Project #**: 5012106

Sample		Result
ID	Compound	(mg/kg)
MB	TPH/Gas	ND
MB	MTBE	ND
MB	Benzene	ND
MB	Toluene	ND
MB	Ethyl Benzene	ND
MB	Xylenes	ND

	Sample		Result	Spike	%
Sample #	ID	Compound	(mg/kg)	Level	Recv.
27867	CMS	TPH/Gas		NS	
	CMS	Benzene	0.088	0.100	88.0
	CMS	Toluene	0.089	0.100	89.4
	CMS	Ethyl Benzene	0.088	0.100	88.4
	CMS	Xylenes	0.265	0.300	88.4

	Sample		Result	Spike	%	
Sample #	ID	Compound	(mg/kg)	Level	Recv.	RPD
27867	CMSD	TPH/Gas		NS		
	CMSD	Benzene	0.096	0.100	96.3	9.0
	CMSD	Toluene	0.095	0.100	94.5	5.6
	CMSD	Ethyl Benzene	0.092	0.100	91.6	3.6
	CMSD	Xylenes	0.272	0.300	90.7	2.5

MB = Method Blank; LCS = Laboratory Control Sample; CMS = Client Matrix Spike; CMSD = Client Matrix Spike Duplicate NS = Not Spiked; OR = Over Calibration Range; NR = No Recovery



 QC Batch #:
 5250
 Lab Project #:
 5012106

Sample ID	Compound Name	Result (ug/kg)
MB	1,1-dichloroethene	ND
MB	benzene	ND
MB	trichloroethene	ND
MB	toluene	ND
MB	chlorobenzene	ND

Surrogates	Result (ug/kg)	% Recovery	Acceptance Range (%)
dibromofluoromethane (20)	20.4	102	70 – 130
toluene-d <sub>8</sub> (20)	19.7	98.5	70 – 130
4-bromofluorobenzene (20)	19.4	97.0	70 – 130

Sample ID	Compound Name	Result (ug/kg)	Spike Level	% Recv.
LCS	1,1-dichloroethene	28.5	25.0	114
LCS	benzene	27.3	25.0	109
LCS	trichloroethene	23.9	25.0	95.6
LCS	toluene	26.6	25.0	106
LCS	chlorobenzene	26.4	25.0	106

Surrogates	Result (ug/kg)	% Recovery	Acceptance Range (%)
dibromofluoromethane (20)	20.3	102	70 – 130
toluene-d <sub>8</sub> (20)	19.8	99.0	70 – 130
4-bromofluorobenzene (20)	19.1	95.5	70 – 130



Sample ID	Compound Name	Result (ug/kg)	Spike Level	% Recv.	RPD
LCSD	1,1-dichloroethene	28.0	25.0	112	1.8
LCSD	benzene	26.6	25.0	106	2.6
LCSD	trichloroethene	23.4	25.0	93.6	2.1
LCSD	toluene	25.8	25.0	103	3.1
LCSD	chlorobenzene	25.7	25.0	103	2.7

Surrogates	Result (ug/kg)	% Recovery	Acceptance Range (%)
dibromofluoromethane (20)	20.2	101	70 – 130
toluene-d <sub>8</sub> (20)	19.8	99.0	70 – 130
4-bromofluorobenzene (20)	19.2	96.0	70 – 130

MB = Method Blank; LCS = Laboratory Control Sample; CMS = Client Matrix Spike; CMSD = Client Matrix Spike Duplicate NS = Not Spiked; OR = Over Calibration Range; No Recovery

**QC Batch #:** 5249 **Lab Project #:** 5012106

Sample

LCSD

Lead (Pb)

ID MB	Compound Lead (Pb)	(mg/kg) ND			
Sample ID LCS	Compound Lead (Pb)	Result (mg/kg) 25.6	Spike Level 25.0	% <b>Recv.</b> 102	
Sample ID	Compound	Result (ma/ka)	Spike Level	% Recv	RPF

Result

MB = Method Blank; LCS = Laboratory Control Sample; CMS = Client Matrix Spike; CMSD = Client Matrix Spike Duplicate NS = Not Spiked; OR = Over Calibration Range; NR = No Recovery



### **Analytical Sciences**

NESTWIND BOULEVARD   COMPANY NAME:   December   Decem	INI INI	(707) 769-31 CLIENT INFORMATION	(707) 769-312 RMATION	28 28	110 Liberty Street, Petaluma, CA 94952 (707) 769-3128		ING II		MATT	NO		> 38 88 8	LAB PROJECT NUMBER: SCS ENGINEERS PROJECT NUMBER: SE PAGINEERS PROJECT NUMBER:	LAB PROJECT NUMBER: VGINEERS PROJECT NUMBER: MEERS PROJECT NUMBER:	ECT NI ROJECT NIFGT N	JMBER NAME	SOO SEEKS	12106 puiss +	Pun Co
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PARTIELD SAMPLE TO COMMERCE TO	FAX #: (707)	544-5769				FAX	#					ις.	DAYS		1 1	Norm	$ \times $	000	)
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PO Box 750336 Petaluma, CA 94975-0336 Telephone: (707) 769-3128 110 Liberty Street Petaluma, CA 94952 Fax: (707) 769-8093

Report Date: February 28, 2005

Kevin Coker SCS Engineers 3645 Westwind Boulevard Santa Rosa, CA 95403

### LABORATORY REPORT

Project Name: Weeks Drilling & Pump 01203340.00

Lab Project Number: 5020801

This 7 page report of analytical data has been reviewed and approved for release.

Mark A. Valentini, Ph.D.

Mark A. Valentini

**Laboratory Director** 



### **TPH Gasoline & MBTEX in Water**

Lab #	Sample ID	Analysis	s Result (ug/	/L) RDL (ug/L)
28173	MW-1	TPH/Gasolir	ne ND	50
		MTBE	ND	2.5
		Benzene	ND	0.5
		Toluene	ND	0.5
		Ethyl Benze	ene ND	0.5
		Xylenes	ND	1.5
Date Sampled:	02/07/05	Date Analyzed: 02	2/08/05	QC Batch #: 5296
ate Received:	02/08/05	Method: Ef	PA 5030/8015M/8020	

Lab #	Sample ID	Analys	sis	Result (ug/L	.) R	DL (ug/L)
28174	MW-2	TPH/Gaso	line	ND		50
		MTBE		3.1		2.5
		Benzene		ND		0.5
		Toluene		ND		0.5
		Ethyl Benz	zene	ND		0.5
		Xylenes		ND		1.5
Date Sampled: Date Received:	02/07/05 02/08/05		02/08/05 EPA 5030/80 <sup>2</sup>	15M/8020	QC Batch #:	5296

Lab #	Sample ID	Analy	/sis		R	DL (ug/L)
28175	MW-3	TPH/Gase	oline	87		50
		MTBE		4.7		2.5
		Benzene		ND		0.5
		Toluene		1.1		0.5
		Ethyl Ber	nzene	ND		0.5
		Xylenes		3.2		1.5
Date Sampled:	02/07/05	Date Analyzed:	02/08/05		QC Batch #:	5296
Date Received:	02/08/05	Method:	EPA 5030/801	5M/8020		



Lab #	Sample ID	Analy	sis	Result (ug/l	_) RDL (ug/L)
28176	MW-4D	TPH/Gaso	oline	120	50
		MTBE		ND	2.5
		Benzene		0.55	0.5
		Toluene		ND	0.5
		Ethyl Ben	zene	ND	0.5
		Xylenes		2.8	1.5
Date Sampled: Date Received:	02/07/05 02/08/05	Date Analyzed: Method:	02/08/05 EPA 5030/8015	M/8020	QC Batch #: 5296

Lab #	Sample ID	Analysis	Result (ug/L)	RDL (ug/L)
28177	MW-5	TPH/Gasoline	2,600	500
		MTBE	31	25
		Benzene	200	5.0
		Toluene	ND	5.0
		<b>Ethyl Benzene</b>	120	5.0
		Xylenes	ND	15

Date Sampled:	02/07/05	Date Analyzed:	02/14/05	QC Batch #:	5296
Date Received:	02/08/05	Method:	EPA 5030/8015M/8020		

Lab #	Sample ID	Analysis	Result (ug/L)	RDL (ug/L)
28178	MW-6	TPH/Gasoline	ND	50
		MTBE	ND	2.5
		Benzene	ND	0.5
		Toluene	ND	0.5
		Ethyl Benzene	ND	0.5
		Xylenes	ND	1.5
		-		

Date Sampled:	02/07/05	Date Analyzed:	02/08/05	QC Batch #: 5296
Date Received:	02/08/05	Method:	EPA 5030/8015M/8020	



Lab #	Sample ID	Analys	sis Result (ug	g/L) RDL (ug/L)
28179	MW-7	TPH/Gaso	line 110	50
		MTBE	8.3	2.5
		Benzene	1.0	0.5
		Toluene	0.62	0.5
		Ethyl Benz	zene 1.1	0.5
		Xylenes	1.8	1.5
Date Sampled: Date Received:	02/07/05 02/08/05		02/08/05 EPA 5030/8015M/8020	QC Batch #:5296

Lab #	Sample ID	Analy	/sis	Result (ug/l	L) RDL (ug/L)
28180	MW-8	TPH/Gase	oline	ND	50
		MTBE		ND	2.5
		Benzene		ND	0.5
		Toluene		ND	0.5
		Ethyl Ber	zene	ND	0.5
		Xylenes		ND	1.5
Date Sampled: Date Received:		Date Analyzed: Method:	02/08/05 EPA 5030/80	15M/8020	QC Batch #: 5296

Lab #	Sample ID	Analysis	Result (ug/L)	RDL (ug/L)
28181	MW-9	TPH/Gasoline	280,000	10,000
		MTBE	1,400	500
		Benzene	7,300	100
		Toluene	11,000	100
		<b>Ethyl Benzene</b>	6,700	100
		Xylenes	28,000	300

Date Sampled:	02/07/05	Date Analyzed:	02/14/05	QC Batch #:	5296
Date Received:	02/08/05	Method:	EPA 5030/8015M/8020	•	



Date Received: 02/08/05

Lab Project #: 5020801

Lab #	Sample ID	Analysis	Result (ug/L	.) RDL (ug/L)
28182	MW-10D	TPH/Gasoline	6,000	500
		MTBE	42	25
		Benzene	500	5.0
		Toluene	23	5.0
		Ethyl Benzene	73	5.0
		Xylenes	200	15
Date Sampled:	02/07/05	Date Analyzed: 02/14/05		QC Batch #: 5296

Method: EPA 5030/8015M/8020

Lab #	Sample ID	Analysis	Result (ug/L	) RDL (ug/L)
28183	MW-11	TPH/Gasoline	17,000	500
		MTBE	130	25
		Benzene	55	5.0
		Toluene	74	5.0
		Ethyl Benzene	560	5.0
		Xylenes	710	15
Date Sampled: Date Received:	02/07/05 02/08/05	Date Analyzed: 02/08/05 Method: EPA 5030/8	8015M/8020	QC Batch #: 5296

Lab #	Sample ID	Analysis	Result (ug/L	RDL (ug/L)
28184	MW-12	TPH/Gasoline	33,000	2,500
		MTBE	270	100
		Benzene	1,200	20
		Toluene	520	20
		Ethyl Benzene	2,600	20
		Xylenes	3,300	60
Date Sampled:	02/07/05	Date Analyzed: 02/08/05, 0	2/14/05	QC Batch #: 5296
Date Received:	02/08/05	Method: EPA 5030/8	3015M/8020	



Lab #	Sample ID	Analysis	Result (ug/L)	RDL (ug/L)
28185	MW-13	TPH/Gasoline	240	50
		MTBE	ND	2.5
		Benzene	5.1	0.5
		Toluene	11	0.5
		Ethyl Benzene	11	0.5
		Xylenes	38	1.5

 Date Sampled:
 02/07/05
 Date Analyzed:
 02/14/05
 QC Batch #:
 5296

 Date Received:
 02/08/05
 Method:
 EPA 5030/8015M/8020



### LABORATORY QUALITY ASSURANCE REPORT

QC Batch #: 5296 Lab Project #: 5020801

Sample ID	Compound	Result (ug/L)
MB	TPH/Gas	ND
MB	MTBE	ND
MB	Benzene	ND
MB	Toluene	ND
MB	Ethyl Benzene	ND
MB	Xylenes	ND

	Sample		Result	Spike	%
Sample #	ID	Compound	(ug/L)	Level	Recv.
28186	CMS	TPH/Gas		NS	
	CMS	Benzene	10.2	10.0	102
	CMS	Toluene	10.5	10.0	105
	CMS	Ethyl Benzene	10.6	10.0	106
	CMS	Xylenes	31.0	30.0	103

	Sample		Result	Spike	%	
Sample #	ID	Compound	(ug/L)	Level	Recv.	RPD
28186	CMSD	TPH/Gas		NS		
	CMSD	Benzene	10.2	10.0	102	0.64
	CMSD	Toluene	10.5	10.0	105	0.04
	CMSD	Ethyl Benzene	10.6	10.0	106	0.41
	CMSD	Xylenes	31.2	30.0	104	0.87

MB = Method Blank; LCS = Laboratory Control Sample; CMS = Client Matrix Spike; CMSD = Client Matrix Spike Duplicate NS = Not Spiked; OR = Over Calibration Range; NR = No Recovery





## CHAIN OF CUSTODY LAB PROJECT NUMBER: 50,20801

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		154116°	,1(0)			1110 11 11 11 11 11 11 11 11 11 11 11 11	11 37	( 6/34	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			ပို့ လ	SCS ENGINEERS PROJECT NAME:	EERS	ROJE	NAM IS		eks.	Weeks Drilling & Pump		
<u> </u>	COMPANY NAME: SCS ENGINEERS	NGINEERS				CONTACT: Ward Thompson	13 	12 72		9		SCS E	NGINEE	RS PR	DJECT	SCS ENGINEERS PROJECT NUMBER:		1203	01203340.00		
	ADDRESS: 3645 WESTWIND BOULEY	VESTWIND	BOULE	VARD	COMP	COMPANY NAME: Weeks Dilling & Pung	;; 3	Z SX	يااانع	2 2	0 4		2///8/24//19/2021/19//	(97.9%)	18 3.4				GEOTRACKER EDF:	××	
	SANTA	SANTA ROSA, CA 95403	₹ 9540	3		ADDRESS:	و ا	205	asoc	600 Sebastopol Rd.	9.	Mobil	MOBILE LAB		ĺ				GLOBAL ID: TO 6097 00 487	100 487	
	CONTACT: Kevin Caker	n Coker					v	software	وُ	Saborstopol, CA 95473	17.2	SAM	SAME DAY		1	24 Hours	URS		COOLER TEMPERATURE		_
	PHONE#: (707) 546-9461	46-9461				PHONE#:		701-542	1-327	ر ا لا		481	48 Hours			72 Hours	RS I		ပ္		
	Fax #: (707) 544-5769	44-5769			:	FAX#:						S	5 DAYS			NoR	NORMAL		200		
													7	4					PAGE 1 OF 2		
<u> </u>	ITEM CLIENT SAMPLE ID.	DATE SAMPLED	TIME	MATRIX	# CONT.	PRESV. YES/NO	X3T8/SAS/H9T 8 MTBE 0508/M3108 A93	HTT MOTOR OIL MOTOR OIL EPA 8015M	HYDROCARBONS EPA 8260 (FULL LIST)	EPA 8260 Full List + Oxy / Fuel Additives BTEX & OXYGENATES	+ PB SCAVENGERS  EPA 8260B  OXYGENATED  FUEL ADDITIVES	EPA 8260M CHLORINATED SOLVENTS	SEMI-VOLATILE HYDROCARBONS	EPA 8270 TRPH / TOG M1819 418,1M	PESTICIDES / PCB'S EPA 8081 / 8141 / 8082	CAM 17 METALS / S LUFT METALS	TOTAL LEAD		COMMENTS	LAB SAMPLE #	
	1 MM-1	2/07/05	Shal	F1 &	4	کملا	×													28173	
	2 MW-2	2) Orlos	1119	110	1	Yes	×													44.18C	
	3 MM-3	200 300	300	LIQ	ı	76.5	×													28/75	
	4 MM-4D	2 07 05	310	۲۱۵	4	765	×					$\dashv$								28176	
	5 MW-5	2/51/05 19c0	iaco	<u>ر</u> م	T	72.5	×													28177	
	6 MM-6	2010	SHE	110	7	76.5	×													28178	
	L-MM -	2/61/05	210	10	J	76.5	×													28179	
	8 MM-8	2 (51) 05	100	7	7	25	×													28180	
	9 MW-9	2 60 05 215	215	817	J	725	. 🛪													18181	
	MW-10D	2 67 05	355	01	7	Yes	x					$\dashv$		_						28182	
	11 - MW - 11	2/67/05 230	330	017	T	40.6	x	$\dashv$	$\dashv$	$\dashv$	-	$\dashv$	4							28183	
Ex Sec.										S. (2.7.2)											
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	Received BY:	. 1_	2		DATE::	.	.	TIME:			REC	EIVED	RECEIVED/BY LABORATORY:	ORATO	<u>κ</u>						
	RELINQUISHED BY:				DATE::		1	TIME:			ן נ	<b>X</b>	De la	h					2-8-05	10:50	
_	RECEIVED BY:				DATE:			TIME:			SIGN	SIGNATURE							DATE	TIME	

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## CHAIN OF CUSTODY LAB PROJECT NUMBER: 5020501

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	- 1	_									_							
ġ.	1	X Y N	100487	32				LAB SAMPLE #	78184	58188								
SCS ENGINEERS PROJECT NAME: WOLK Drilling + Pund	01203340.00	GEOTRACKER EDF: X Y	GLOBAL ID: TOWORTOOUS	COOLER TEMPERATURE	ပ္	203	PAGE 2 OF 2	COMMENTS					:					
2 2 1	130	G.																
180		5.1		SS	ا ا	<u>₹</u>		TOTAL LEAD										l
NAME	SCS ENGINEERS PROJECT NUMBER:	64/2017 1 1 1 1 1 1 1 1 2 2 1 1 1 1 2 (ART) 4 1 1 1 2		24 Hours	72 Hours	NORMAL		CAM 17 METALS / S LUFT METALS										
ROJECT	ECT N	1111						PESTICIDES / PCB'S EPA 8061 / 8141 / 8082										
ERS Pr	s PRO.							TRPH / TOG Mr.814 A93 / H0S38 M2										
NGINE	INEER		8	¥	l SR	, K		SEMI-VOLATILE HYDROCARBONS EPA 8270						,				
SCSE	S ENG	./ 1	MOBILE LAB	SAME DAY	48 Hours	5 DAYS		CHLORINATED SOLVENTS										
	တ္တ				1	1 1		OXYGENATED FUEL ADDITIVES M08S8 A93										
*		A CHANGE	Rd.	SLH S	ĺ			BTEX & OXYGENATES + PB SCAVENGERS EPA 8260B										
101	00		1000	8	<sup>佐</sup>			EPA 8260 Full List + Oxy / Fuel Additives										
LEVE	Quo	ئا الأنه	tabo	901,09	- 32			VOLATILE HYDROCARBONS EPA 8260 (FULL LIST)										
(2.0.3)	芦萸	84	95 0	Sabastopol, CA 95473	L 542-3212			TPH DIESEL / MOTOR OIL EPA 8015M										
13 3	3	3 3	9	3				TPH/GAS/BTEX & MTBE EPA 8015M/8020	х	×								
11. 11. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	CONTACT: WORD Thompson	COMPANY NAME: MECHS Drilling & Pump	ADDRESS: 6100 Saloastapol Rd.		PHONE#:	FAX #:	Revision (II)	PRESV.	7es	165								
		COMP						# CONT.	4	J								
		ARD						MATRIX	L10	L) Q								
3		30ULEV	95403					TIME	4105	350								
3 1777.31	SINEERS	GNIWTS	osa, CA	Coker	6-9461	4-5769		DATE SAMPLED	2/61/05 1/05	3/57/05								
ार्डिंड १ ज्यानिक निर्मात है।	COMPANY NAME: SCS ENGINEERS	ADDRESS: 3645 WESTWIND BOULEY	SANTA ROSA, CA 95403	CONTACT: Kewin Coker	PHONE#: (707) 546-9461	Fax #: (707) 544-5769		DATE SAMPLE ID. SAMPLED	MW-13	MW-13								
	COMP							ПЕМ	-	2	3	4	9	9	7	8	6	•
10.5 N. W. W.							. 1				_			_	_		_	-

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2-8-05 DATE

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Time: 70 570
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Time:

DATE:: DATE::

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RECEIVED BY:

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DATE:: DATE:

Report Date: April 8, 2005

Kevin Coker SCS Engineers 3645 Westwind Boulevard Santa Rosa, CA 95403

### LABORATORY REPORT

Project Name: Weeks Drilling 01203340.00

Lab Project Number: 5032804

This 5 page report of analytical data has been reviewed and approved for release.

Mark A. Valentini, Ph.D. Laboratory Director

PO Box 750336 Petaluma, CA 94975-0336 Telephone: (707) 769-3128



### **TPH Gasoline & BTEX in Water**

Lab #	Sample ID	Analysis	Result (ug/L)	RDL (ug/L)
29057	MW – 9	TPH/Gasoline	65,000	1,000
		Benzene	3,700	100
		Toluene	2,900	100
		<b>Ethyl Benzene</b>	1,800	100
		Xylenes	2,600	300
Date Sampled:	03/25/05	Date Analyzed: 03/29/05,		C Batch #:5434
Date Received:	03/28/05	Method: EPA 5030	/8015M/8020	

### Oxygenated Gasoline Additives by GC/MS in Water

Lab #	Sample ID	Compound	Name	Result (ug/L)	RDL (ug/L)
29057	MW – 9	tert-butyl alcohol methyl tert-butyl di-isopropyl ethe ethyl tert-butyl et tert-amyl methyl	ether (МТВЕ) er (DIPE) ther (ЕТВЕ)	ND 23 ND ND ND	120 5.0 5.0 5.0 5.0
Surro	ogates (ug/L)	Result (ug/L)	% Recovery	Acceptance	e Range (%)
dibromofluc	promethane (20)	21.9	116	70 –	- 130
Date Sample Date Receive		Date Analyzed: 03/3 Method: EPA	0/05 8260B	QC Batch #	: 5436



### LABORATORY QUALITY ASSURANCE REPORT

**QC Batch #:** 5434 **Lab Project #:** 5032804

Sample ID	Compound	Result (ug/L)
MB	TPH/Gas	ND
MB	MTBE	ND
MB	Benzene	ND
MB	Toluene	ND
MB	Ethyl Benzene	ND
MB	Xylenes	ND

	Sample		Result	Spike	%
Sample #	ID	Compound	(ug/L)	Level	Recv.
29058	CMS	TPH/Gas		NS	
	CMS	Benzene	10.4	10.0	104
	CMS	Toluene	10.2	10.0	102
	CMS	Ethyl Benzene	10.5	10.0	105
	CMS	Xylenes	30.5	30.0	102

	Sample		Result	Spike	%	
Sample #	ID	Compound	(ug/L)	Level	Recv.	RPD
29058	CMSD	TPH/Gas		NS		
	CMSD	Benzene	10.5	10.0	105	1.4
	CMSD	Toluene	10.4	10.0	104	1.6
	CMSD	Ethyl Benzene	10.4	10.0	104	1.5
	CMSD	Xylenes	30.5	30.0	102	0.06

MB = Method Blank; LCS = Laboratory Control Sample; CMS = Client Matrix Spike; CMSD = Client Matrix Spike Duplicate NS = Not Spiked; OR = Over Calibration Range; NR = No Recovery



Sample ID	Compound Name	Result (ug/L)
MB	1,1-dichloroethene	ND
MB	benzene	ND
MB	trichloroethene	ND
MB	toluene	ND
MB	chlorobenzene	ND

Surrogates	Result (ug/L)	% Recovery	Acceptance Range (%)
dibromofluoromethane (20)	23.6	118	70 – 130
toluene-d <sub>8</sub> (20)	20.5	103	70 – 130
4-bromofluorobenzene (20)	18.3	91.5	70 – 130

Sample #	Sample ID	Compound Name	Result (ug/L)	Spike Level	% Recv.
29063	CMS	1,1-dichloroethene	21.0	25.0	84.0
	CMS	benzene	23.0	25.0	92.0
	CMS	trichloroethene	20.1	25.0	80.4
	CMS	toluene	22.0	25.0	88.0
	CMS	chlorobenzene	21.8	25.0	87.2

Surrogates	Result (ug/L)	% Recovery	Acceptance Range (%)
dibromofluoromethane (20)	21.7	109	70 – 130
toluene-d <sub>8</sub> (20)	20.3	102	70 – 130
4-bromofluorobenzene (20)	18.2	91.0	70 – 130



Sample #	Sample ID	Compound Name	Result (ug/L)	Spike Level	% Recv.	RPD
29063	CMSD	1,1-dichloroethene	21.7	25.0	84.0	3.3
	CMSD	benzene	24.2	25.0	92.0	5.1
	CMSD	trichloroethene	21.8	25.0	80.4	8.1
	CMSD	toluene	22.8	25.0	88.0	3.6
	CMSD	chlorobenzene	24.4	25.0	87.2	11

Surrogates	Result (ug/L)	% Recovery	Acceptance Range (%)
dibromofluoromethane (20)	21.5	108	70 – 130
toluene-d <sub>8</sub> (20)	19.5	97.5	70 – 130
4-bromofluorobenzene (20)	18.2	91.0	70 – 130

 $\label{eq:mb} \begin{subarray}{ll} MB = Method Blank; \ LCS = Laboratory \ Control \ Sample; \ CMS = Client \ Matrix \ Spike; \ CMSD = Client \ Matrix \ Spike; \ CMSD = Client \ Matrix \ Spike; \ Duplicate \ NS = Not \ Spiked; \ OR = Over \ Calibration \ Range; \ NR = No \ Recovery \end{subarray}$ 





## CHAIN OF CUSTODY LAB PROJECT NUMBER: 50 32807

Analytical Sciences
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2	COMPANY NAME: SCS ENGINEERS	NGINEERS				CONTACT:	r. Chris.		homioson)		SCS	SCS ENGINEERS PROJECT NUMBER:	RS PRO	JECT N	UMBER		0170	1403340.00	
	ADDRESS: 3645 WESTWIND BOU	VESTWIND	BOULE	LEVARD	COMP	COMPANY NAME:			Vina 1		T .	TURNAROUND TIME (check one)	ROUN	D TIN	E (che	ck one	9)	GEOTRACKER EDF:	N A
	SANTA	SANTA ROSA, CA 95	95403	3		Address:	0.0	Cox J	176		MoBil	MOBILE LAB						GLOBAL ID: 7046 9700 48	9700487
	CONTACT: LEVIN	1 Colle					Soba	ebastonol (	9 0 √2	95473	SAN	SAME DAY		1	24 Hours	RS		COOLER TEMPERATURE	<b> </b>
	PHONE#: (707) 546-9461	46-9461				PHONE#:	)	547-3	SATA		<u>8</u>	48 Hours			72 Hours	<u>ي</u>		٢	
	Fax #: (707) 544-5769	44-5769				FAX #:	 				2	5 DAYS		1 1	NORMAL	<u>~  </u> 		000	
											- ANALYSIS	SIS					7	PAGE (OF /	
ITEM	CLIENT SAMPLE ID.	DATE SAMPLED	TIME	MATRIX	cont.	PRESV.	X3T8/8A5/HqT 36##80.8 A943/8020 A943/8020 A943/8020 A943/803/8 A943/803/8	VOLATILE HYDROCARBONS EPA 8260 (FULL LIST)	EPA 8260 Full List + Oxy / Fuel Additives	+ PB SCAVENGERS  EPA \$260B  OXYGENATED  FUEL ADDITIVES	CHLORINAES CHLORINATED SOLVENTS	SOLVENTS SEMI-VOLATILE HYDROCARBONS EPA 8270	M 1.814 ATS 418.1M	PESTICIDES / PCB'S	CAM 17 METALS / STATEM TRUES	TOTAL LEAD	54405	COMMENTS	LAB SAMPLE #
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PO Box 750336 Petaluma, CA 94975-0336 Telephone: (707) 769-3128

Report Date: May 20, 2005

Kevin Coker SCS Engineers 3645 Westwind Boulevard Santa Rosa, CA 95403

### LABORATORY REPORT

Project Name: Weeks Drilling & Pump 01203340.00

Lab Project Number: 5050903

This 6 page report of analytical data has been reviewed and approved for release.

Mark A. Valentini, Ph.D. Laboratory Director

PO Box 750336 Petaluma, CA 94975-0336 Telephone: (707) 769-3128



### **TPH Gasoline & MBTEX in Water**

Lab #	Sample ID	Analysis	Result (ug/L)	RDL (ug/L)
29693	MW-1	TPH/Gasoline	ND	50
		MTBE	ND	2.5
		Benzene	ND	0.5
		Toluene	ND	0.5
		Ethyl Benzene	ND	0.5
		Xylenes	ND	1.5

 Date Sampled:
 05/05/05
 Date Analyzed:
 05/11/05
 QC Batch #:
 5523

 Date Received:
 05/09/05
 Method:
 EPA 5030/8015M/8020

Lab #	Sample ID	Analysis	Result (ug/L)	RDL (ug/L)
29694	MW-2	TPH/Gasoline	ND	50
		MTBE	3.7	2.5
		Benzene	ND	0.5
		Toluene	ND	0.5
		Ethyl Benzene	ND	0.5
		Xylenes	ND	1.5

 Date Sampled:
 05/05/05
 Date Analyzed:
 05/11/05
 QC Batch #:
 5523

 Date Received:
 05/09/05
 Method:
 EPA 5030/8015M/8020

Lab #	Sample ID	Analysis	Result (ug/L)	RDL (ug/L)
29695	MW-3	TPH/Gasoline	ND	50
		MTBE	5.7	2.5
		Benzene	ND	0.5
		Toluene	ND	0.5
		Ethyl Benzene	ND	0.5
		Xylenes	ND	1.5

 Date Sampled:
 05/05/05
 Date Analyzed:
 05/11/05
 QC Batch #:
 5523

 Date Received:
 05/09/05
 Method:
 EPA 5030/8015M/8020



Lab #	Sample ID	Analy	/sis	Result (ug/L	RDL (ug/L)
29696	MW-4D	TPH/Gasoline		52	50
		MTBE		ND	2.5
		Benzene		1.0	0.5
		Toluene		0.5	0.5
		Ethyl Ben	nzene	ND	0.5
		Xylenes		2.2	1.5
Date Sampled: Date Received:		Date Analyzed: Method:	05/11/05 EPA 5030/8015M	M/8020	QC Batch #:5523

Lab #	Sample ID	Analysis	Result (ug/L)	RDL (ug/L)
29697	MW-5	TPH/Gasoline	170	50
		MTBE	ND	2.5
		Benzene	21	0.5
		Toluene	ND	0.5
		Ethyl Benzene	14	0.5
		Xylenes	ND	1.5

Date Sampled:	05/05/05	Date Analyzed:	05/11/05	QC Batch #:	5523
Date Received:	05/09/05	Method:	EPA 5030/8015M/8020		

Lab #	Sample ID	Analysis	Result (ug/L)	RDL (ug/L)
29698	MW-6	TPH/Gasoline	ND	50
		MTBE	ND	2.5
		Benzene	ND	0.5
		Toluene	ND	0.5
		Ethyl Benzene	ND	0.5
		Xylenes	ND	1.5

Date Sampled:	05/05/05	Date Analyzed:	05/11/05	QC Batch #:	5523
Date Received:	05/09/05	Method:	EPA 5030/8015M/8020	· -	_



Lab #	Sample ID	Analy	/sis	Result (ug/	L) RDL (ug/L)	)
29699	MW-7	TPH/Gase	oline	ND	50	
		MTBE		4.9	2.5	
		Benzene		ND	0.5	
		Toluene		ND	0.5	
		Ethyl Ber	nzene	ND	0.5	
		Xylenes		ND	1.5	
Date Sampled: Date Received:	05/06/05 05/09/05	Date Analyzed: Method:	05/11/05 EPA 5030/80	15M/8020	QC Batch #:5523	_

Lab #	Sample ID	Analysis	Result (ug/L	.) RDL (ug/L)
29700	MW-8	TPH/Gasoline	ND	50
		MTBE	ND	2.5
		Benzene	ND	0.5
		Toluene	ND	0.5
		Ethyl Benzene	ND	0.5
		Xylenes	ND	1.5
Date Sampled: Date Received:	05/05/05 05/09/05	Date Analyzed: 05/11/05  Method: EPA 5030/8	015M/8020	QC Batch #: _5523

Lab #	Sample ID	Analysis	Result (ug/L	.) RDL (ug/L)
29701	MW-10D	TPH/Gasoline	3,200	500
		MTBE	ND	25
		Benzene	430	5.0
		Toluene	ND	5.0
		<b>Ethyl Benzene</b>	300	5.0
		Xylenes	20	15
Date Sampled: Date Received:	05/06/05 05/09/05	Date Analyzed: 05/11/05 Method: EPA 5030/	/8015M/8020	QC Batch #: <u>5523</u>



Lab #	Sample ID	Analysis	Result (ug/L	.) RDL (ug/L)
29702	MW-11	TPH/Gasoline	11,000	500
		MTBE	ND	25
		Benzene	26	5.0
		Toluene	80	5.0
		Ethyl Benzene	540	5.0
		Xylenes	620	15
Date Sampled: Date Received:	05/06/05 05/09/05	Date Analyzed: 05/11/05  Method: EPA 5030/	8015M/8020	QC Batch #:5523

Lab #	Sample ID	Analy	ysis	Result (ug/l	L) RDL (ug/L)
29703	MW-12	TPH/Gase	oline	26,000	2,500
		MTBE		ND	100
		Benzene		2,100	20
		Toluene		210	20
		Ethyl Ber	nzene	2,500	20
		Xylenes		1,800	60
Date Sampled:	05/06/05 05/09/05	Date Analyzed: Method:	05/11/05 EPA 5030/801	5M/8020	QC Batch #: <u>5523</u>

Lab #	Sample ID	Analysis	Result (ug/	L) RDL (ug/L)
29704	MW-13	TPH/Gasoline	53	50
		MTBE	ND	2.5
		Benzene	1.5	0.5
		Toluene	ND	0.5
		Ethyl Benzene	2.4	0.5
		Xylenes	2.0	1.5
Date Sampled: Date Received:	05/06/05 05/09/05	Date Analyzed: 05/11 Method: EPA 8	/05 5030/8015M/8020	QC Batch #: _5523



### LABORATORY QUALITY ASSURANCE REPORT

**QC Batch #:** 5523 **Lab Project #:** 5050903

Sample ID	Compound	Result (ug/L)
MB	TPH/Gas	ND
MB	MTBE	ND
MB	Benzene	ND
MB	Toluene	ND
MB	Ethyl Benzene	ND
MB	Xylenes	ND

	Sample		Result	Spike	%
Sample #	ID	Compound	(ug/L)	Level	Recv.
29693	CMS	TPH/Gas		NS	
	CMS	Benzene	9.57	10.0	95.7
	CMS	Toluene	10.0	10.0	100
	CMS	Ethyl Benzene	10.0	10.0	103
	CMS	Xylenes	29.5	30.0	98.3

	Sample		Result	Spike	%	
Sample #	ID	Compound	(ug/L)	Level	Recv.	RPD
29693	CMSD	TPH/Gas		NS		
	CMSD	Benzene	9.26	10.0	92.6	3.3
	CMSD	Toluene	9.65	10.0	96.5	3.9
	CMSD	Ethyl Benzene	9.93	10.0	99.3	3.9
	CMSD	Xylenes	28.4	30.0	94.9	3.6

MB = Method Blank; LCS = Laboratory Control Sample; CMS = Client Matrix Spike; CMSD = Client Matrix Spike Duplicate NS = Not Spiked; OR = Over Calibration Range; NR = No Recovery





# CHAIN OF CUSTODY LAB PROJECT NUMBER: 5050903

Analytical Sciences
P.O. Box 750336, Petaluma, CA 94975-0336
110 Liberty Street, Petaluma, CA 94952
(707) 769-3128

			00000
CLIENT INFORMATION	BILLING INFORMATION	ENVIRONET PROJECT NAME: Macakes Drilling & Plump	KS Drilling & Pump
COMPANY NAME: SCS ENGINEERS-ENVIRONET	CONTACT: Ward Thompson	ENVIRONET PROJECT NUMBER: 0126 3340.60	3340.00
ADDRESS: 3645 WESTWIND BOULEVARD	COMPANY NAME: Weaks Drilling & Plumo	TURNAROUND TIME (check one)	GEOTRACKER EDF: X Y N
SANTA ROSA, CA 95403	ADDRESS: (0100 Schoostopol Rd.	MOBILE LAB	GLOBAL ID: TO609700487
CONTACT: Mayin Coker	and local soda?	SAME DAY 24 HOURS	COOLER TEMPERATURE
PHONE#: (707) 546-9461	PHONE#: 101-543-3373	48 Hours 72 Hours	ၞ
FAX #: (707) 544-5769	FAX#:	5 DAYS NORMAL X	200

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	OXYGENATED FUEL ADDITIVES M0358 A93												RES		ı	1
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	TPH DIESEL / MOTOR OIL M3108 A93													1	7.1	TIME
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### CHAIN OF CUSTODY LAB PROJECT NUMBER: 5050903

Analytical Sciences
P.O. Box 750336, Petaluma, CA 94975-0336\*\*
110 Liberty Street, Petaluma, CA 94952
(707) 769-3128

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SCS ENGINEERS PROJECT NAME: WELLS DITILING & PUMP	SCS Engineers ProJect Number: C)1303340.00	GEOTRACKER EDF: X	GLOBAL ID: TOWOOT 1 004	COOLER TEMPERATURE	o,	PAGE 3 OF 3	COMMENTS											
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BILLING INFORMATION	CONTACT: MOUND Thompson	COMPANY NAME: WEEKS Drilling & Pump	ADDRESS: 6100 Selos hoor Rd	PHONE#	FAX#:		PRESV.	105	105									
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CLIENT INFORMATIC	COMPANY NAME: SCS ENGINEERS	ADDRESS: 3645 WESTWIND BOULEVARD	SANTA ROSA, CA	CONTACT: Newin Coke of PHONE#: (707) 546-9461	FAX #: (707) 544-5769		CLIENT SAMPLE ID.	MM-19	MW-13									
	COM				*		ITEM	-	2	3	4	2	9	7	8	6	10	7

PO Box 750336 Petaluma, CA 94975-0336 Telephone: (707) 769-3128 SIGNATURES

TIME: TIME: TIME:

5905

RELINQUISHED BY:

### **Appendix F**

Standard Soil and Water Sampling Procedures and QA/QC Protocol

### STANDARD SOIL AND WATER SAMPLING PROCEDURES AND QA/QC PROTOCOL

**December 15, 2003** 

SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
STANDARD SOIL SAMPLING PROCEDURES

The following outline describes the standard equipment and procedures used by SCS Engineers (SCS) personnel for the collection of soil samples for laboratory analysis.

### **Equipment**

Modified California split-spoon drive sampler, standard penetration sampler, or direct push core barrel (Drill rig sampling)

Drive sampler (hand auger samples)

Typical 1.5-inch to 2.0-inch diameter by 6.0 inch long brass or stainless steel liners and plastic end-caps. Teflon sheets or aluminum foil will also be used for samples suspected of containing volatile compounds (gasoline, aromatic hydrocarbons, solvents, etc.)

Appropriate sample holders will be used for samples suspected of containing volatile compounds (gasoline, aromatic hydrocarbons, solvents, etc.) when EPA Method 5035 sampling is required by the regulatory agency. Standard sample containers will be used when field preservation occurs for EPA Method 5035 compliance.

Typical 1.5-inch to 2.5-inch diameter by 6.0 inch long plastic or metal liners for direct push core barrel.

PID organic vapor analyzer (OVA) or equivalent Field Detector

Sampler and Sample Container Cleaning Equipment:

Stiff-bristle brushes

**Buckets** 

Detergent (Non-phosphate detergent recommended)

Deionized/potable water

Insulated sample storage and shipping containers (ice chests) and blue ice Insulated sample storage and shipping containers (ice chests) and dry ice for EPA Method 5035 sample holders which cannot be delivered to the laboratory within 48 hours for preservation

Personal protective equipment (generally level D protection).

### **General Sampling Procedures**

Soil samples are collected in accordance with regulatory guidance. Soil sampling procedures are updated as new guidance is provided by regulatory agencies. Sampling equipment (i.e., sample liners, auger bits, sampling devices) are pre-washed as necessary with a brush in a detergent solution, followed by double rinsing with distilled or deionized water prior to each sampling event. All new sample liners will have been pre-washed prior to use. All samples are collected in such a manner as to minimize the volatilization or oxidation due to agitation and/or mixing upon handling.

Soil samples collected by hand augering for lithologic logging, and for chemical and physical analyses are typically obtained by pounding the sample tube into the soil being tested. If an auger hole is drilled with a motorized drill rig, samples are typically collected using a drive sampler, which is driven approximately 18 to 24 inches below the depth of the auger bit. The sampling methodology may be adjusted on a case-by-case basis, depending on the suspected contaminant(s). Where required, EPA Method 5035 sample holders will be filled as rapidly as possible to prevent volatilization from either a sample sleeve or directly from the formation where feasible.

Soil samples collected from a backhoe bucket or from an accessible pit or excavation (ramped or shored) are collected by removing excess material to expose as fresh as possible soil. The sample liner is then pushed into the soil until the liner is full. Where required, EPA Method 5035 sample holders will be filled as rapidly as possible to prevent volatilization directly from the formation or from the backhoe bucket after a small amount of material is removed to expose a fresh surface where feasible.

Standard metal liners will be submitted for analysis in those circumstances where EPA Method 5035 sample holders are deemed to be unusable (gravel or extremely dense material). EPA Method 5035 preservation times will still be required of the laboratory.

When utilizing the split spoon sampler with a drill rig, the portions of the soil sample recovered in additional liners are also examined and noted for any contamination and/or changes in lithology.

The soils, when required, are classified in accordance with the Unified Soil Classification System (USCS). Sample liner ends selected for analysis are typically covered with teflon sheets and sealed with plastic end caps, stored in a cooler (4° C), and transported to a California Department of Health Services Certified Analytical Laboratory for the requested analyses (except where there is no State certification for the analysis being conducted). If storage is required prior to delivery to the laboratory or laboratory courier, the samples are stored in a secure refrigerator prior to delivery. EPA Method 5035 sample holders used to comply with EPA Method 5035 sample collection procedures will be collected and stored in a cooler (4° C), and transported to a California Department of Health Services Certified Analytical Laboratory for preservation within 48 hours of sample collection. In the event the samples cannot be delivered to the Laboratory to meet the 48 hour preservation requirement, the samples will be placed in an ice chest with dry ice and kept frozen either in the ice chest with adequate dry ice or in a secure freezer until they can be delivered to the Laboratory for proper preservation. The Laboratory may receive the samples at the job site for field preservation, in which case standard sample tubes will be used.

All sample containers are labeled in the field. The sample labels will typically contain the following information:

Sample identification number (including depth and stratigraphic position where applicable)

Project name

Project address

Sampler initials

Date of collection

Other pertinent information

Chain-of-Custody documents are completed in the field and accompany the samples to the laboratory. The Chain-of-Custody document will typically contain the following information:

Sample identification number (including depth and stratigraphic position where applicable)

Project name

Project address

Project number

Sampler (printed and signed)

Date and time of collection (for each sample)

Matrix type (soil, water, etc.)

Analyses and turn-around-time requested

**Billing Information** 

Other pertinent information

### **Stockpile Sampling**

Discrete samples from thin stockpiles are collected in brass or stainless steel liners, by removing 6 inches to 1 foot of soil and driving the brass or stainless steel liner into the stockpile. Soil samples are collected from thick stockpiles containing volatile contaminants by either augering or otherwise excavating approximately one third to one half way into the pile and then driving the sample liner into the soil in the hole, or collecting a sample from the backhoe bucket. Surface or near surface samples will be collected from homogenized stockpiles containing non-volatile contaminants such as metals, motor oil, or oil and grease.

For final verification characterization, discrete soil samples will be collected at intervals required by regulation, or by the lead regulator for the disposal or treatment option selected. EPA Method 5035 sampling procedures, as indicated above, will be followed for discrete and/or verification sampling when directed by the regulatory agency and/or the receiving facility. EPA Method 5035 sampling procedures, as described above, will not be followed for composite sampling for disposal unless directed by the landfill(s) in order to profile the soil for disposal.

### STANDARD GROUNDWATER SAMPLING PROCEDURES

The following outline describes the standard equipment and procedures which are used by SCS personnel for the collection of groundwater samples for laboratory analysis.

### **Monitoring Well Development**

After monitoring wells are installed and prior to initial sampling of the wells, well development is conducted. Well development is conducted to create an effective filter pack around the well screen, to optimize hydraulic communication between the formation and the well screen, and to assist in restoring the natural water quality near the well. Well development is also conducted to remove fines and to remove any foreign materials introduced during drilling.

Well development will be conducted as follows:

- 1. Record the static water level and total well depth.
- 2. Set the pump and record the pumping rate. Pump until the turbidity reaches the desired level, typically measured using a turbidity meter.
- 3. Discontinue pumping and begin surging using a properly designed surge block and proper surging technique.
- 4. Measure and record well depth to determine the amount of fines and repeat Step 2.
- 5. Repeat surging and pumping until the well yields water of acceptable turbidity at the beginning of a pumping cycle.

Depending on the depth of the water, the hydraulic conductivity of the aquifer, and the diameter of the well, pumping may effectively achieve well development. Wells completed in very silty geologic units also may produce consistently turbid samples. Wells of this type will normally be considered to have been properly installed and developed and turbid water samples will be considered representative of mobile constituents in the aquifer.

### **Monitoring Well Sampling**

Groundwater sampling and evaluation of monitoring wells begins by removal of the well caps and measuring water levels in all monitoring wells at a site with a water level indicator. The fluid in the well is then monitored for the presence of free floating material. If free product is present in the well, its thickness is measured using an oil-water interface probe. A program of free product removal may be initiated. A groundwater sample is typically not collected from any well with confirmed free floating product unless a directive to do so is received from the regulatory agency.

All monitoring wells are typically checked for free product until authorization has been received from the lead regulatory agency that checking for free product is no longer necessary. Water levels will continue to be checked until field measurements indicate that equilibrium has been achieved from which to compute the groundwater flow direction and gradient.

If free product is not present in the well being monitored, the well is purged, with groundwater parameters such as pH, conductivity, and temperature measured after each well volume removed. This process continues until parameters being measured such as pH, conductivity, and temperature, have generally stabilized (reproducible within 10%). As a general practice, a minimum of 3 well casing volumes or until the well goes dry constitutes adequate purging. For 2-inch diameter wells, a minimum of 5 gallons of water should be removed unless the well goes dry. Wells will be purged from least to most contaminated after the initial round of sampling. The purge pump will be placed near the top of the measured water table to assure that fresh water from the formation will move upward in the screen. Water will be purged from the well at a rate that does not cause recharge water to be excessively agitated. The purge pump will be lowered into the well as necessary to achieve the desired removal of groundwater.

Once a well has been adequately purged, a groundwater sample is collected using a disposable or pre-cleaned bailer. The groundwater sample is collected from the well in containers appropriate to the analyses being conducted. As examples, 1 liter amber bottles are used for diesel/motor oil/kerosene and oil and grease analyses, 40 milliliter volatile organic analysis vials are used for gasoline BTEX, 8010, 8240, and 8260 analyses, and plastic containers are used for total and/or dissolved metals. Volatile organic analysis vials will be immediately capped after collection and placed on ice to minimize loss of volatiles. All other groundwater sample containers collected will be capped and placed in a storage container in a timely manner and as appropriate for the analysis being conducted. Proper containers, sampling collection procedures, and storage requirements will be verified with the analytical laboratory prior to sample collection. Monitoring wells at a site are purged prior to collection of samples, unless the regulatory agency has approved non-purge samples.

After the wells have been adequately purged, they will be allowed to recover to 80% of their original volume prior to sampling. Any well purged to dryness will be sampled after a sufficient volume of groundwater has entered the well to enable the collection of the necessary groundwater samples. All collected groundwater samples are stored in an ice chest on blue ice and transported under Chain-of-Custody documentation. The samples are either transported directly to the analytical laboratory on the day of collection, delivered to the laboratory courier on the day of collection, or are returned to SCS's office where they are stored in a secure refrigerator and then delivered to a California Department of Health Services Certified Analytical Laboratory or a laboratory courier for the requested analyses (except where there is no State certification for the analysis being conducted). Every effort will be made to assure that sample storage will not exceed 72 hours before delivery of the samples to either the laboratory or the laboratory courier. Samples being analyzed for constituents with a longer holding time, such as metals, may be stored for a longer period of time, provided the holding time is not exceeded, before delivery to the laboratory.

Where more than one site is sampled on the same day by the sampler, samples from each site will be stored in separate ice chests. If feasible, samples suspected of being highly impacted will be stored separately from samples which are presumed to be clean. To the extent feasible, samples will be separated based on site and suspected degree of impact while awaiting delivery to or pick up by the analytical laboratory.

All purged fluid is stored on-site in DOT 55-gallon drums pending analysis. The drums and the fluid in the drums are the exclusive property and responsibility of the responsible party. SCS typically samples the drums and arranges for disposal at the appropriate time.

### **Grab Water Samples**

Grab water samples may be collected from the pits, borings, discrete sampler borings, creeks, ponds, and any other bodies or vessels containing water. If the water sample can be safely collected by hand, it will be, otherwise, a disposable bailer will typically be used to collect the sample.

All collected grab water samples will be stored on ice and transported under Chain-of-Custody documentation. The samples will either be delivered directly to the analytical laboratory or to the analytical laboratory courier on the day of the collection, or they will be returned to SCS' office where they will stored in a secure refrigerator a maximum of 72 hours, and then delivered to a California Department of Health Services Certified Analytical Laboratory for the requested analyses (except where there is no State certification for the analysis being conducted) or the laboratory courier. Again, samples being analyzed for constituents with a longer holding time, such as metals, may be stored for a longer period of time before delivery to the laboratory.

Typically, no purge water will be generated during grab water sampling. Should purging occur, the purge water will be stored on-site in either a DOT 55-gallon drum, or other appropriate vessel, pending analysis. Industry standards are that drums and all produced water are the exclusive property and responsibility of the responsible party. SCS will typically sample such containers and arrange for disposal at the appropriate time.

### Sample Handling-QA/QC Elements

### **Sample Handling**

The elapsed time between sample collection and delivery to the laboratory or the laboratory courier will typically not exceed 72 hours. Again, samples being analyzed for constituents with a longer holding time, such as metals, may be stored for a longer period of time before delivery to the laboratory, providing the holding time is not exceeded.

Sealed sample containers will only be opened by laboratory personnel during the specified sample extraction process.

### **Chain-of-Custody**

In order to document and trace sample possession from time of collection, a Chain-of-Custody record will be filled out on the Chain-of-Custody document by the sampler for each sample collected. The Chain-of-Custody document will accompany the sample(s) through laboratory analysis. The completed Chain-of-Custody record for each sample will be included in the analytical report from the laboratory.

### Blanks

Blanks will be used or collected as part of the sampling program at the discretion of the project manager and/or the lead regulatory agency. Trip and/or field blanks will be supplied and analyzed along with the samples, at the discretion of the project manager and/or the lead regulatory agency.

### **Modifications**

Any modification to the standard sampling procedures and QA/QC protocol outlined in this document for either soil or water samples will be noted and fully explained in the sampling report.

### PERSONAL PROTECTION

Sampling at environmental sites increases the chance of exposure of the sampling technician to chemicals which pose a threat to the environment and may pose a threat to the sampler's short-term and/or long-term health at the concentrations present. Each site will be evaluated prior to conducting any field work to ascertain the chemicals detected in the past, the chemicals likely to be detected in the future, and the likely concentrations of those chemicals to be detected. The chemicals will be evaluated for possible routes of exposure at the concentrations likely to be encountered. Appropriate personal protective equipment to prevent contact with contaminants shall be used. Appropriate chemical-specific gloves shall be worn and changed between sampling events.

In the event the sampler observes or detects activities occurring on or around the site which could cross contaminate collected samples, the sampler will suspend sampling until the activities which may lead to cross contamination cease. If necessary, the sampler will abort the sampling event. Any aborted sampling event will be rescheduled after the suspicious activities are indicated to have ceased, or the activities can be halted during the sampling event. Any suspension or aborting of sampling will be immediately reported to the appropriate registered professional.

Site-specific protection measures are outlined in the Site Health and Safety Plan, where active investigation and/or remediation is occurring.

### **Active Investigation and/or Remediation**

(Refer to Site Specific Health and Safety Plan)

Required personal protective equipment:

Hardhats Steel toed boots

Recommended personnel protective equipment:

Eye protection

Hearing protection

Gloves to protect against dermal contact with contaminants

Skin protection from sunlight

Photoionization detector/Gas Tech

Respirator (NIOSH approved with appropriate filters for contaminants detected or expected)

Detergent wash and rinse water

First aid kit

Fire extinguisher

Route map to and phone number of nearest hospital

As indicated above, each site must be evaluated on a case-by-case basis to determine the appropriate personal protection materials to use and personal protection activities to implement in the field. As an example, several sun tan lotions contain chemicals which are detected in the diesel range. Care must be taken to prevent cross contamination by sun tan lotion at diesel impacted sites.

### **Passive Investigation**

Recommended personnel protective equipment:

Skin protection

Eye protection

Gloves to protect against dermal contact with contaminants

Detergent wash and rinse water

First aid kit

Fire extinguisher

Route map to and phone number of nearest hospital

As indicated above, each site must be evaluated on a case-by-case basis to determine the appropriate personal protection materials to use and personal protection activities to implement in the field. If a site is known to be heavily impacted, wells should be sampled from the cleanest to most impacted to minimize the potential for cross contamination. The potential for cross contamination can be further minimized by wearing disposable gloves and disposing of gloves after each sample is collected. As an alternative, hands can be washed and rinsed between each sampling event. Where contaminants are non-volatile and do not migrate readily, such as metals, personal protection can be modified to match the primary routes of exposure, which are inhalation and ingestion. In this case it may be appropriate to wear a dust mask if excessive dust is created during sampling. Washing of hands and face before eating or drinking is highly recommended. Protection of clothing by wearing Tyveks is also to be considered, along with washing clothing after each use in conditions where significant dust is created.

Personal protection is designed to prevent or minimize the exposure to the sampler of chemicals or substances which may adversely impact either the short-term or long-term health of the sampler. It is the sampler's responsibility to adequately protect themselves from exposure. All samplers are encouraged to protect themselves and their health to the extent feasible while in the field. All materials necessary to provide adequate protection are available and should be utilized as appropriate.

Cross contamination is to be minimized at all times while sampling. In some instances, proper use and implementation of personal protection will also aid in minimizing cross contamination. The sampler is very highly encouraged to implement proper personal protection, especially where it further minimizes the risk of cross contamination of samples.